FEBRUARY, 1951

Railway Engineering and Maintenance

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QUALITY CONCRETE
for enduring, economical structures

HIGH BRIDGES like this one on the Kansas City Southern Railway near Kansas City are especially vulnerable to the destructive forces of weathering. Yet this concrete arch bridge has suffered little from more than 20 years of continuous exposure to wind, rain, snow, sleet, heat, cold and frequent freezing and thawing cycles.

Such resistance to weathering is typical of quality concrete construction. Concrete structures can be designed to withstand any natural wearing action—underwater, underground or in the atmosphere.

In the long run durable construction is the most economical too. Structures that resist weathering last longer and need less maintenance. That's why concrete is ***low-annual-cost*** construction.

Durable, economical structures are the result of applying proven principles and procedures of quality concrete construction. These principles and procedures are fully described in a new 70-page illustrated book, "*Design and Control of Concrete Mixtures.*" Write for your free copy today. It is distributed only in the United States and Canada.

PORTLAND CEMENT ASSOCIATION
DEPT. A2-27, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

SIMPLICITY of DESIGN

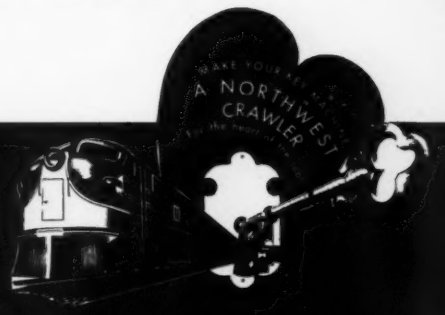
DOES mean lower cost

HAVE you considered the problem of equipment upkeep in relation to your cranes? Look at the deck of a Northwest. It is clean. Only two main shafts. Few gears. Few adjustments. It is easy to care for. It means less "down time". Conversion, too, from Crane to Dragline, Shovel or Pullshovel is easier. It means less time wasted in changing basic machines to the right one for the job and it means less likelihood of the crew trying to do a job with the wrong equipment.

When you add to this basic advantage all the other Northwest advantages — the Cushion Clutch, the Uniform Pressure Swing Clutches, the Northwest Dual Independent Crowd, Ball and Roller Bearings on all High-Speed Shafts, along with many other cost cutting features, it is no wonder that so many Northwests are serving America's great railroads — And, don't forget the "Feather-Touch" Clutch Control. It means easy operation with greater safety and without complications. Your Northwest *can't be shut down out on the line because of control failure.*

NORTHWEST ENGINEERING CO.
1513 Field Building
135 South LaSalle Street, Chicago 3, Illinois

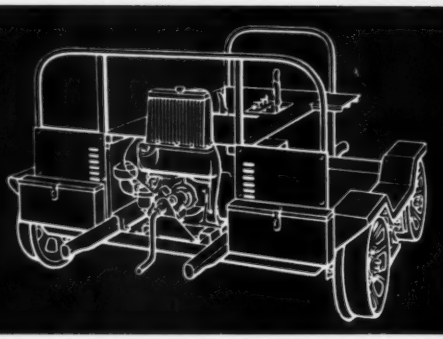
Widening right-of-way on the Chicago, Milwaukee, St. Paul & Pacific Railroad

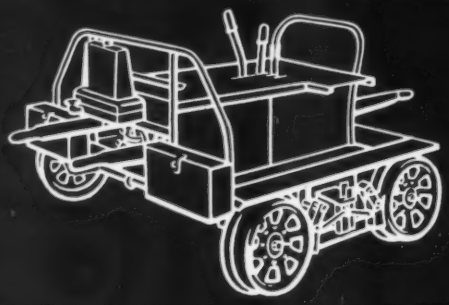


NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL

More safety—more efficiency
— in the new Model 101 inspection car. Four speeds forward, three reverse, with *immediate* reverse attainable without reversing engine. Wheel silencers, rear lifting weight of 98 pounds. Carries four men in comfort — with speed and safety.

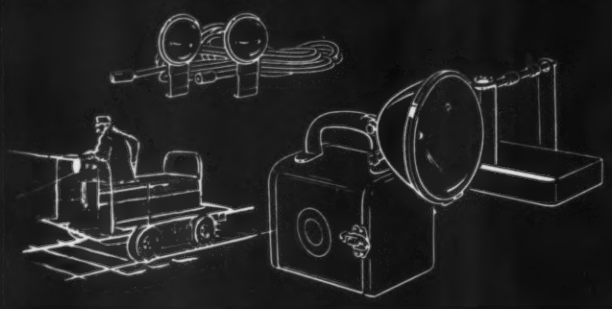




More safety in this modern 57D one-man car. It's fast, light and dependable. Built by men who know railroading problems, the 57D has friends on railroads all over the country.

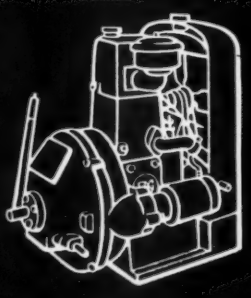
FOR MORE SAFETY...
the name is
FAIRBANKS-MORSE,
a name worth remembering

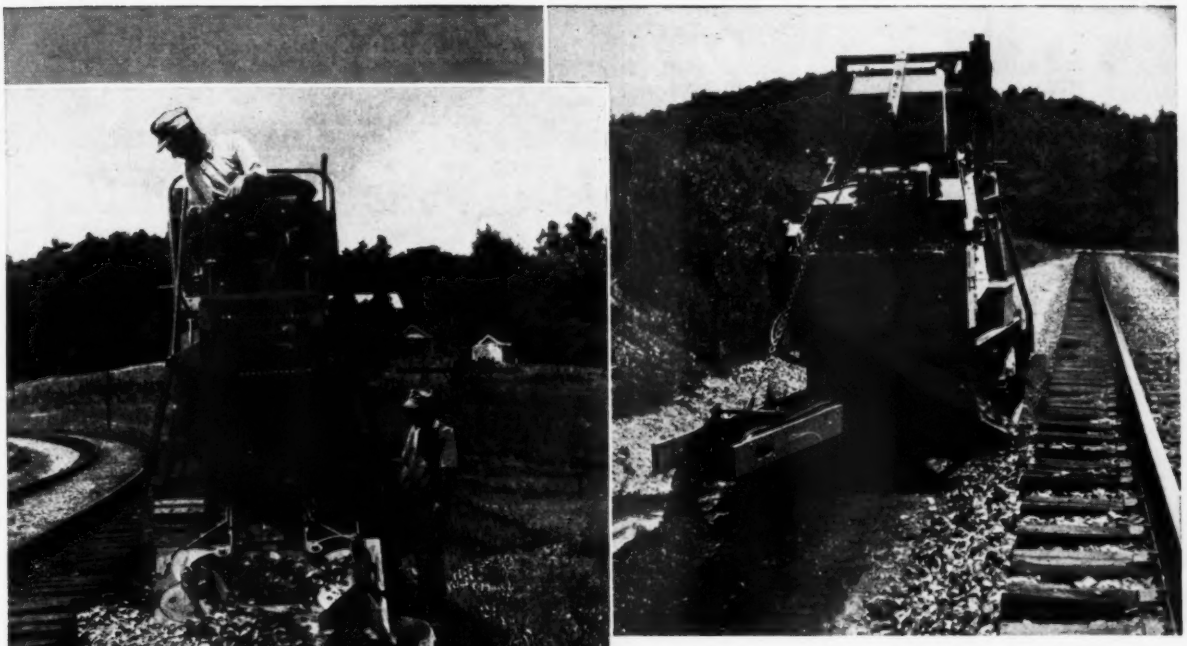
DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • PUMPS • SCALES
HOME WATER SERVICE AND HEATING EQUIPMENT • RAIL CARS • FARM MACHINERY



More safety at night can be inexpensive: the easy installation of rugged weather-proof searchlight and tail lights can save time — and save lives! Portable battery-operated and easy-to-install reversible generator types.

More safety in off-track work for those who depend on Fairbanks-Morse portable generating sets. Widest range of capacities — diesel or gasoline engine models. Write for descriptive literature on any or all of this Fairbanks-Morse signalman's equipment. Fairbanks, Morse & Co., Chicago 5, Illinois.





McWilliams Super Mole Working on the Southern Railroad, Knoxville Division, Season 1950.

Now You Can Clean Track Shoulder at 1,500 Feet Per Hour at Less Than 3½ Cents Per Foot

You get new cleaning economy with the McWilliams Super Mole because now with only one operator and one helper you get fast, off-track cleaning on a mobile unit. The Super Mole excavates and cleans at speeds ranging from 800 ft. to 4,000 ft. per hour—at a cost of less than 3½ cents per foot. It is crawler mounted to give ease of crossing road beds, highways and maneuvering around obstructions. To learn more about the economy of road bed maintenance with the Super Mole write to Railway Maintenance Corporation, P.O. Box 1888, Pittsburgh, Pa.

SPECIFICATIONS

5 traveling speeds—1.5 to 5.4 M.P.H.

5 excavating and cleaning speeds—800 to 4,000 ft. per hr.

Length—20′ 0″

Height—8′ 0″

Digging Width—5′ 0″

Width over treads—4′ 4″

Width of tread—12″

Engine—4-cycle diesel

Governed speed—1450 R.P.M.

Total weight—16,000 lbs.

Railway Maintenance Corporation

Designers and Manufacturers of: Moles; Super Moles; McWilliams Crib Cleaners; HR Track Raiser and Air Tampers; McWilliams Multiple Tool Air Tamper; R.M.C. Rail Joint Packing.

FABCO *Self-Sealing* TIE PADS

Bind Pads to Ties to Keep Out Moisture and Dirt

Conventional illustration of the structure of a Fabco Tie Pad and the special sealer on one side.

FABCO *Self-Sealing* TIE PADS effectively seal out moisture and dirt between the pad and the tie.

Coated only on the side next to the tie. Freedom of movement of the tie plate is permitted with less disturbance to the tie bond.

Special coating is firmly adhered chemically to the pad without decreasing the strength or resilience of the pad.

Sealing agent is specially compounded to withstand extremes of temperature in both summer and winter.

Self sealing pads require no more labor for installation than regular Fabco Tie Pads.

OVER THE YEARS Fabco Tie Pads of resilient rubber and cotton fibre have demonstrated their ability to prevent mechanical wear of ties through elimination of plate cutting, and give long life service as well.

MAINTENANCE OF WAY departments suggested that if Fabco Tie Pads could be bonded to the tie so as to prevent intrusion of moisture or dirt between tie and pad, their effectiveness might be further increased under certain conditions. After exhaustive tests we announce a tie pad sealer that we are confident is superior to anything yet offered . . . Applied to Fabco Tie Pads before shipment it consists of a 1/16" coat of sealing compound on the side of the pad next to the tie. Since tie plates tend to move under traffic, it is advisable not to bond the pad to the plate, but leave the plate free to move, — greatly reducing any tendency to break the seal between the bottom of the pad and the tie . . . Same standard and special sizes as unsealed Fabco Tie Pads, but 5/16" thick instead of ¼".

For Maximum Protection Against Mechanical Wear of Ties
Use Fabco Tie Pads
Sealed or Unsealed According to Conditions

FABREEKA PRODUCTS COMPANY
INCORPORATED
222M Summer Street, Boston 10, Massachusetts

NEW YORK 17, 122 E. 42nd Street — CHICAGO 10, 325 W. Huron Street — DETROIT 2, 6432 Cass Avenue — SPARTANBURG, S. C., P. O. Box 1168

PHILADELPHIA 2, 16 South Broad Street — PITTSBURG 22, 336 4th Avenue — OAKLAND 11, CALIF., 3871 Piedmont Avenue

For additional information, use postcard, pages 103-104

How TIMKEN® bearings keep a trouble-shooter out of trouble

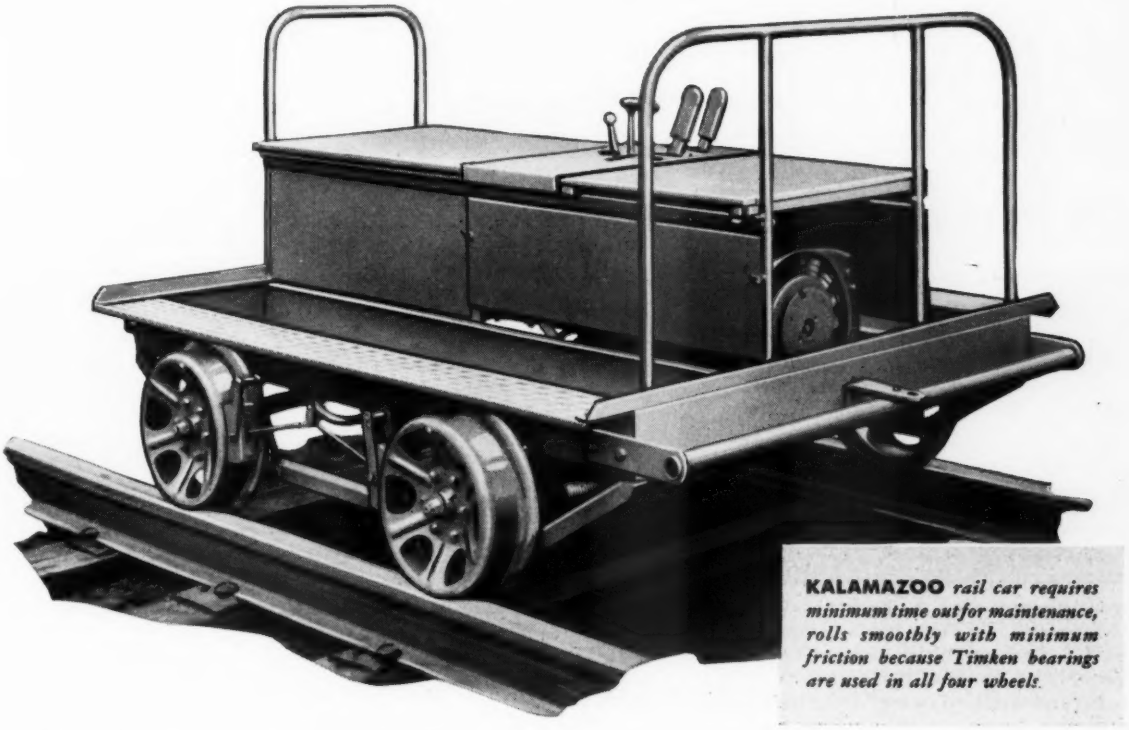
THIS new, lightweight rail car is built to take a 6-man crew anywhere along the line where trouble occurs. To help keep it in top operating condition, the Kalamazoo Manufacturing Company has mounted the four wheels of its "56 A" rail car on Timken® tapered roller bearings. Timken bearings reduce maintenance to a minimum, help prevent breakdowns and enable the car to roll freely in any kind of weather.

Timken bearings are manufactured from the finest steel ever developed for tapered roller bearings—Timken fine alloy steel. Under normal conditions, they last the life of the car. Precision made and finished to incredible smoothness, Timken bearings make friction negligible.

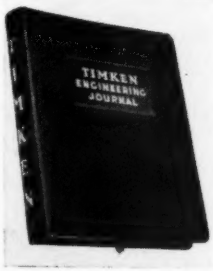
The advanced design of Timken bearings permits the use of tighter closures that keep out dirt and moisture—keep the lubricant in. Lubrication time and maintenance time are minimized. And due to their tapered construction, Timken bearings take any combination of radial and thrust loads. Wheels are kept in positive alignment, and wheel gauge is accurately maintained.

No other bearing can give you *all* the advantages you get with Timken tapered roller bearings. Be sure they are included in all the equipment you build or buy. And always look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



KALAMAZOO *rail car requires minimum time out for maintenance, rolls smoothly with minimum friction because Timken bearings are used in all four wheels.*



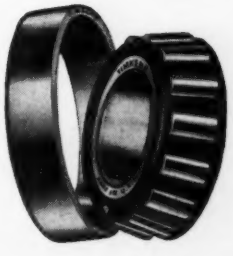
NEW ENGINEERING JOURNAL OFFERED!

529 PAGES! Includes new, technical information on bearing applications available nowhere else. Especially helpful to design engineers. Gives bearing dimensions, capacities, selection and mounting data. For a copy, write on your company letterhead to The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

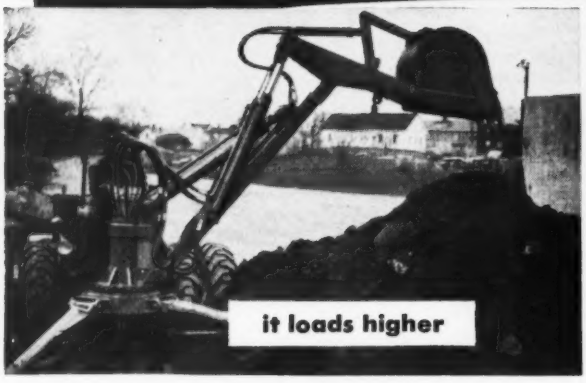


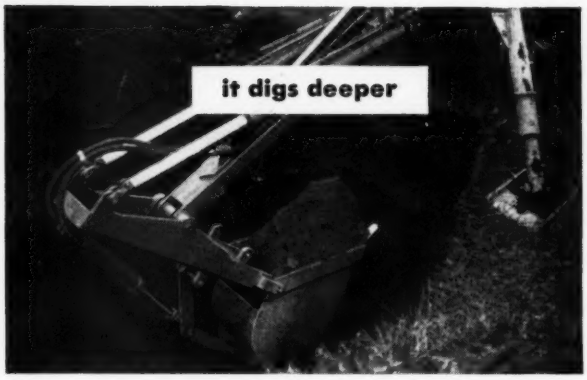
"NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST —◫— LOADS OR ANY COMBINATION ◫

Now... It's even better!

THE OLIVER-WARE Hydro-Trencher

It's Smoother Operating...
No hesitation or "jerks" in the smooth application of hydraulic power. You get smoother, easier handling... more positive control with less operator fatigue.





..and it has a Sensational New "Forced Ejection" Bucket

By simply reversing the bucket and dipper stick, you get a swing loader that loads out material faster than you'd believe possible. "Forced ejection" bucket is available as optional equipment. Standard trencher bucket and standard swing loader bucket are available at slightly lower cost. With standard loader bucket, loading height is 12 feet. Loading height with "forced ejection" bucket is 12½ feet.

The "forced ejection" bucket gives you quick, clean, complete discharge of even the stickiest materials. Bucket gate is hydraulically controlled and travels the complete length of the bucket to "force" out all material.

For complete information on this all-hydraulic, tractor-mounted trencher and swing loader, see your Oliver Industrial Distributor or mail the coupon.

Have you seen the Oliver color movie, "Task Force on Wheels"? Your Oliver Distributor will be happy to arrange a showing.

THE OLIVER CORPORATION

Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

A complete line of Industrial Wheel and Crawler Tractors

The OLIVER Corporation Industrial Division
19300 Euclid Avenue, Cleveland 17, Ohio

Gentlemen: ( ) Send me the facts on the *improved* Oliver-Ware Hydro-Trencher. ( ) I would like to see the Oliver color film, *"TASK FORCE ON WHEELS."*

Name.....

Address.....

Company.....

City.....*State*.....

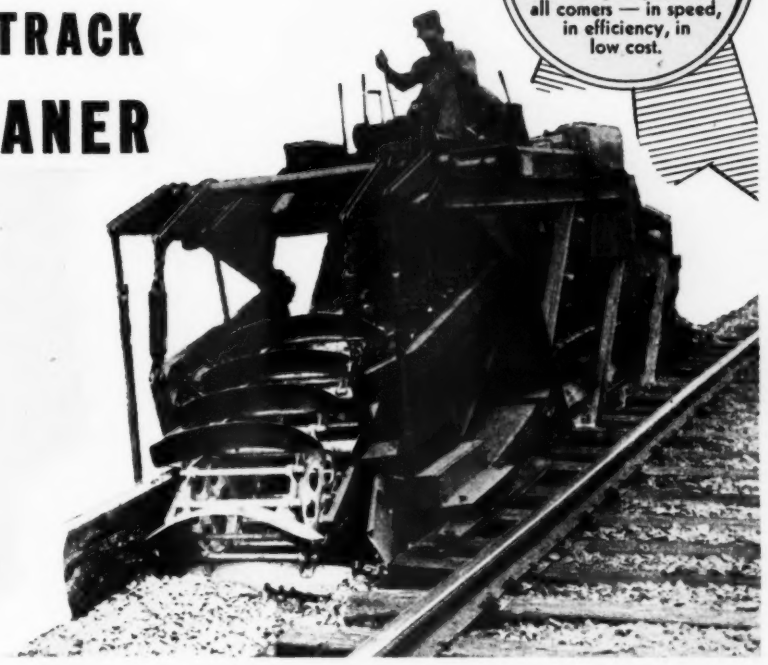
For additional information, use postcard, pages 103-104

SAVE $1,000 PER MILE . .

Cleaning Ballast with the *NEW*

Athey OFF-TRACK BALLAST CLEANER

PROVED in competitive tests on actual railroad jobs, the Athey Ballast Cleaner repeatedly outperformed all comers — in speed, in efficiency, in low cost.



Here's what gives the Athey Ballast Cleaner its production ability...

- Loading speeds up to 0.6 M.P.H. —2½ *yards per minute!*
- Travel speeds up to 5.1 M.P.H.
- Off-the-track operation permits normal traffic flow.
- Narrow width for operating on 20 foot beds.
- Excellent stability for sidehill work and maneuvering.
- High maneuverability — tracks are independently steered!
- 24-inch clearance for easy turning on shoulders . . . safe track crossings!
- Ample traction for rough footing with "Caterpillar" track-type treads.
- Large ground contact area with low ground bearing pressures . . . *approximately 8 pounds per square inch!*
- Cleaning depth positively gauged from top of tie.
- Adjustable to insure depth of cleaning desired.
- Patented full-floating, undershot paddle-blade feeder design.
- Patented arrangement to assure uniform screen load, regardless of shoulder side slope.
- Positive shaking action trans mitted to hopper, screen and to clean ballast return chute. (No chance for material build-up).
- Positive gear drive. loading and transport tractor transmissions.
- Fast-acting hydraulic controls.
- Full visibility of all operations from comfortable operator's seat.
- Dependable operation - proved reliable power — rugged design.
- Easily converted for right or left-hand operation.
- Overall height — 8'10"; width at track — 61"; width of machine —70"; length—31'4".

Here is a completely new, better and proved method of cleaning Ballast. It means a lower investment — sensational low operating costs — higher production — a better and more completely finished job.

Capable of processing 3200 lineal feet of ballast each hour, the new Athey Ballast Cleaner has *proved* its worth on actual railroad jobs . . . has *proved* its amazing time-and-money saving ability . . . has *proved* its work efficiency.

In one steady operation the Athey Ballast Cleaner — with its one-man crew — picks up the fouled ballast . . . cleans it thoroughly of spoils . . . deposits the clean ballast in perfect grade at the tie ends . . . conveys the spoils to the outside shoulder.

Mounted on a "Caterpillar" Diesel D4 Tractor, the Athey Ballast Cleaner has the traction to get through tough going. Working off-the-track, the unit maneuvers easily and in no way interferes with normal road traffic.

The completed job is more thorough than any of the now outmoded methods . . . yet costs hit a new low. The Athey Ballast Cleaner is backed by the facilities of the Athey-"Caterpillar" Dealer, who can give you complete details . . . or write direct to . . .

ATHEY PRODUCTS CORPORATION
5631 West 65th Street Chicago 38, Illinois

Athey APCOR Products

Athey
RAILROAD EQUIPMENT
Backed by over 30 Years of Manufacturing Heavy Equipment.

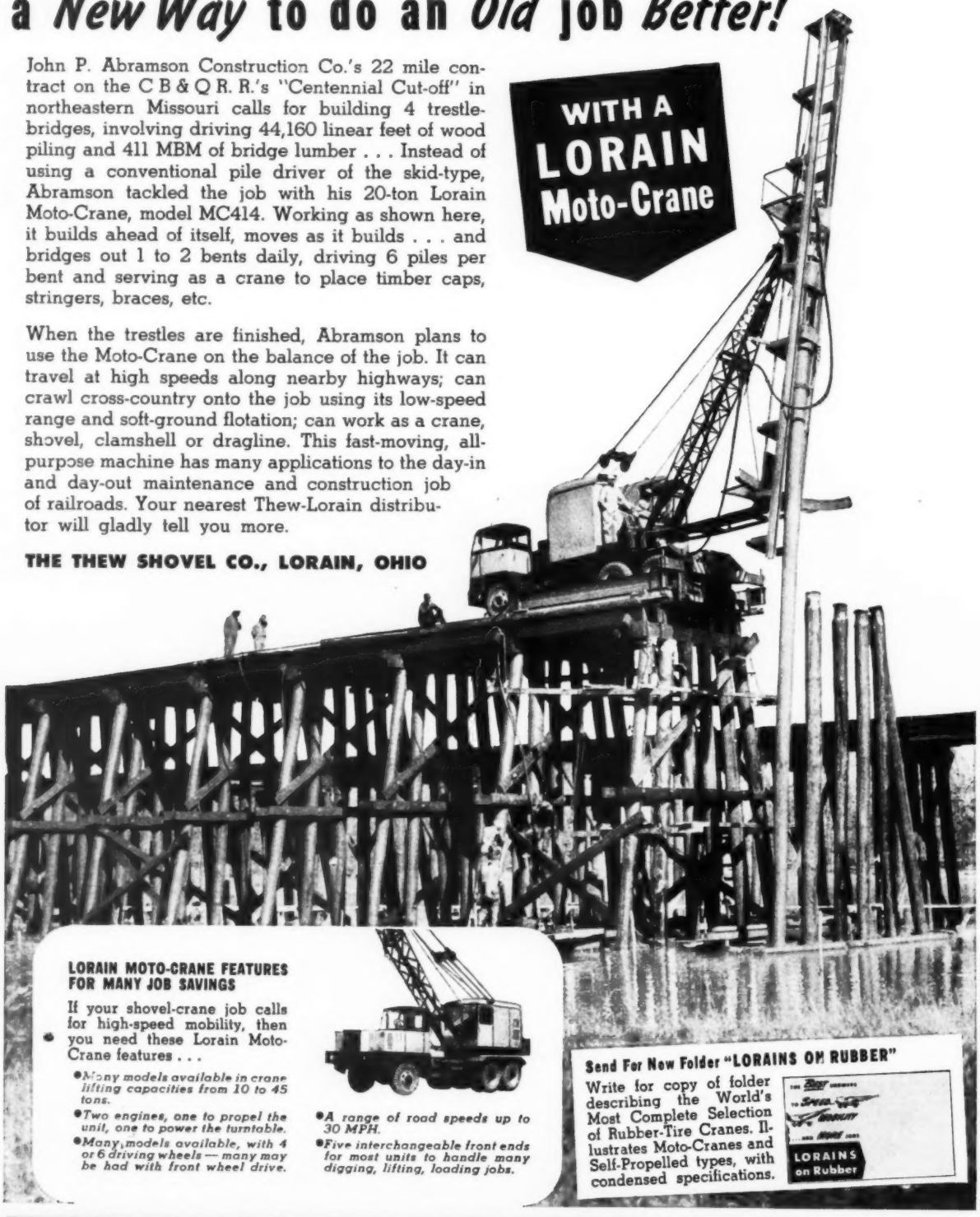
a *New Way* to do an *Old* job *Better!*

John P. Abramson Construction Co.'s 22 mile contract on the C B & Q R. R.'s "Centennial Cut-off" in northeastern Missouri calls for building 4 trestle-bridges, involving driving 44,160 linear feet of wood piling and 411 MBM of bridge lumber . . . Instead of using a conventional pile driver of the skid-type, Abramson tackled the job with his 20-ton Lorain Moto-Crane, model MC414. Working as shown here, it builds ahead of itself, moves as it builds . . . and bridges out 1 to 2 bents daily, driving 6 piles per bent and serving as a crane to place timber caps, stringers, braces, etc.

When the trestles are finished, Abramson plans to use the Moto-Crane on the balance of the job. It can travel at high speeds along nearby highways; can crawl cross-country onto the job using its low-speed range and soft-ground flotation; can work as a crane, shovel, clamshell or dragline. This fast-moving, all-purpose machine has many applications to the day-in and day-out maintenance and construction job of railroads. Your nearest Thew-Lorain distributor will gladly tell you more.

THE THEW SHOVEL CO., LORAIN, OHIO

WITH A LORAIN Moto-Crane



LORAIN MOTO-CRANE FEATURES FOR MANY JOB SAVINGS

If your shovel-crane job calls for high-speed mobility, then you need these Lorain Moto-Crane features . . .

- *Many models available in crane lifting capacities from 10 to 45 tons.*
- *Two engines, one to propel the unit, one to power the turntable.*
- *Many models available, with 4 or 6 driving wheels — many may be had with front wheel drive.*

- *A range of road speeds up to 30 MPH.*
- *Five interchangeable front ends for most units to handle many digging, lifting, loading jobs.*

Send For New Folder "LORAINS ON RUBBER"

Write for copy of folder describing the World's Most Complete Selection of Rubber-Tire Cranes. Illustrates Moto-Cranes and Self-Propelled types, with condensed specifications.

THEW LORAIN®

SHOVELS • CRANES • HOES
DRAGLINES • CLAMSHELLS
ON CRAWLERS OR RUBBER TIRES

OUR HATS ARE OFF TO YOU

FOR EXCEPTIONAL

ILLINOIS CENTRAL

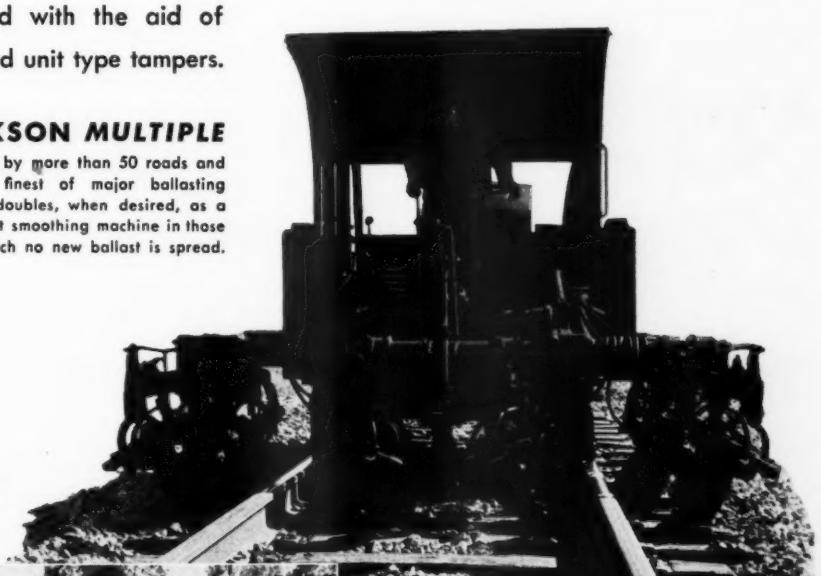
Achievement

On this, your centennial, it is very definitely a great pleasure to congratulate you, one of our oldest customers, on your outstanding achievement — one of the greatest North-South Railway Systems in the nation.

We're mighty proud of the fact that every mile of track, from Chicago to the Gulf of Mexico, is maintained with the aid of JACKSON Multiple and unit type tampers.

The* JACKSON *MULTIPLE

Definitely proved by more than 50 roads and contractors, the finest of major ballasting machines. Also doubles, when desired, as a phenomenally fast smoothing machine in those operations in which no new ballast is spread.



Jackson Manually Guided Tampers greatly multiply the effectiveness of section gangs.

ELECTRIC TAMPER & EQUIPMENT CO.

LUDINGTON, MICHIGAN

Above: UTILITY GRINDER, Model UG, removing flow at switchpoints and stockrails. With other Nordberg accessories, it can be used for surface grinding, rail end slotting, frog grinding, etc. Particularly suited to work in congested traffic areas.

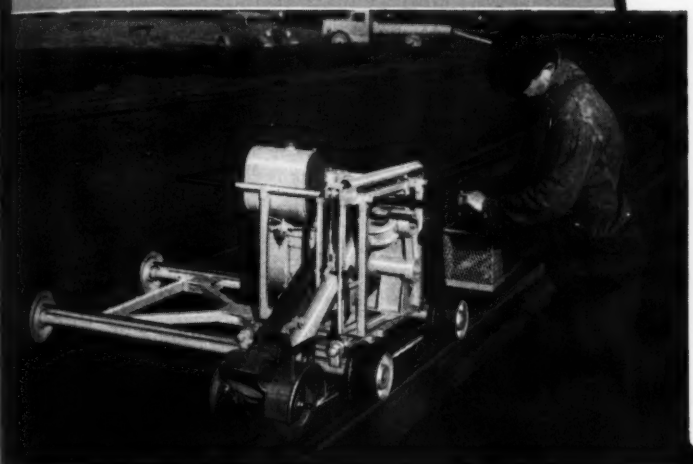
NORDBERG GRINDERS

for every rail, switch or frog grinding job

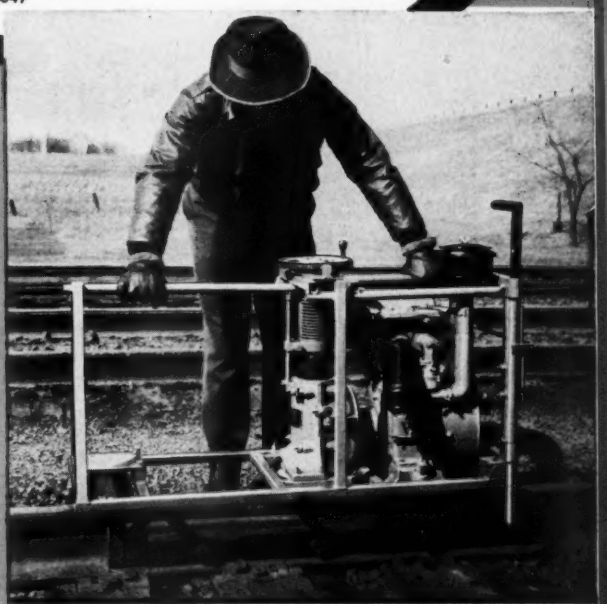
From these Nordberg Grinders, select the grinder best adapted to your track maintenance grinding requirements. You can be assured of faster and better maintenance grinding with Nordberg on the job.

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN

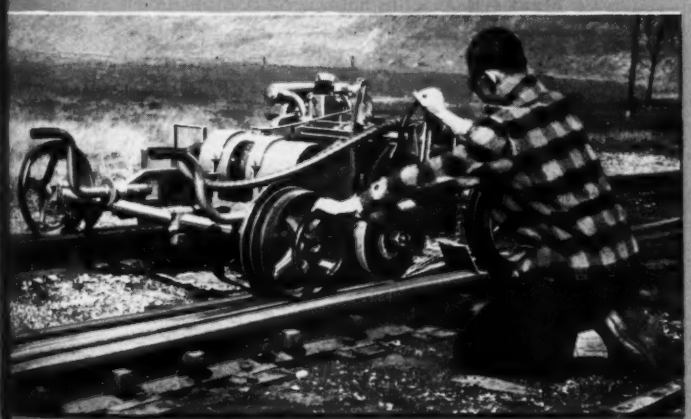
R649



Above: FLEXIBLE ARM GRINDER, Model FG, grinding switchpoint. With various types of grinding wheels this grinder is also used for rail end slotting, undercutting stockrails, grinding frogs, etc. A fast cutting grinder with big production capacity.



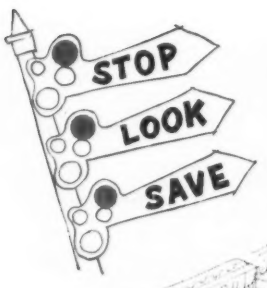
Above: MIDGET GRINDER, Model EG, a one-man cup wheel grinder for surface grinding welded joints, removing mill tolerance, equalizing cropped rails, and grinding out corrugations or wheel burns. It is especially applicable for use in congested traffic areas.



Above: HEAVY-DUTY RAIL GRINDER, Model BDG, grinding a frog. Recommended where speed, output, and accurate surface grinding are desired. With accessories, it can be used for slotting rail ends, grinding switchpoints, and flangeway grinding at frogs and crossings.

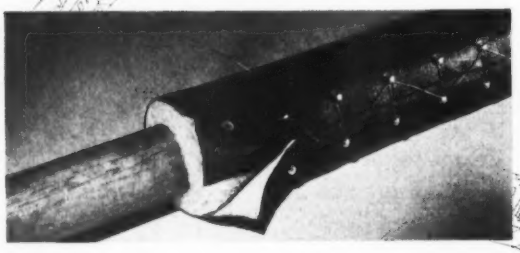
NORDBERG TRACK MAINTENANCE MACHINERY

Saves time — Does better work — Reduces expense



How to take your maintenance costs "for a ride"

Here are 5 ways you can pare your maintenance costs in 1951 . . . with 5 Johns-Manville products designed to stand up under the wear and tear of hard railroad service year after year. Your nearest Johns-Manville office will be glad to give you complete information—or you can get all the facts by writing to Johns-Manville, Box 290, New York 16, N. Y. In Canada, address 199 Bay Street, Toronto 1, Ontario.

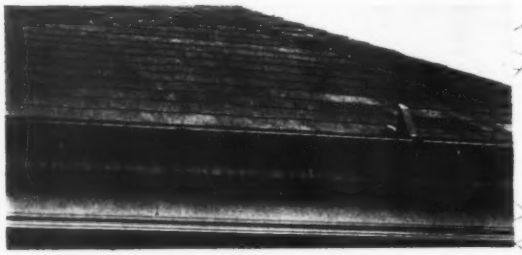


◀ Cover car heating pipes with Thermo-Wrap

This improved lace-type pipe insulation gives maximum protection to heating lines throughout the length of the train. It is easy to install—fits tight and stays tight—withstands the impact of rain, sleet, snow and flying ballast.

Insulate passenger cars with Stonefelt ▶

Applied in blanket form, this specially designed J-M Insulation is fire resistant, will not settle or deteriorate once in place between the car walls. Its excellent insulating qualities also help cut air conditioning and heating costs.

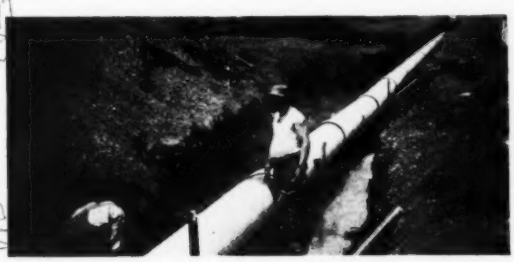


◀ Roof with J-M Asbestos Shingles

Not one of these fireproof, rotproof shingles has ever burned or worn out! They stand up under constant exposure to sun, wind and rain, require little maintenance. Many J-M Asbestos Shingle roofs applied over 30 years ago are still in service.

Use Transite Pipe for water lines ▶

This asbestos-cement pipe cuts water line costs because it resists corrosion . . . withstands vibration . . . and because its high water carrying capacity helps keep pumping costs to a minimum. Its light weight and easily assembled joints simplify installation.



◀ Apply Flexstone Roofing

Each ply of this asbestos roofing is a flexible covering of stone. It is fireproof, rotproof, weatherproof—and *smooth-surfaced* to permit quick, thorough roof drainage. Flexstone roofs will not dry out from the sun—require no periodic coating.

Johns-Manville

93 YEARS OF SERVICE TO TRANSPORTATION

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

Products Index

RAILWAY ENGINEERING AND MAINTENANCE — February, 1951

Please send me additional product information as requested below.

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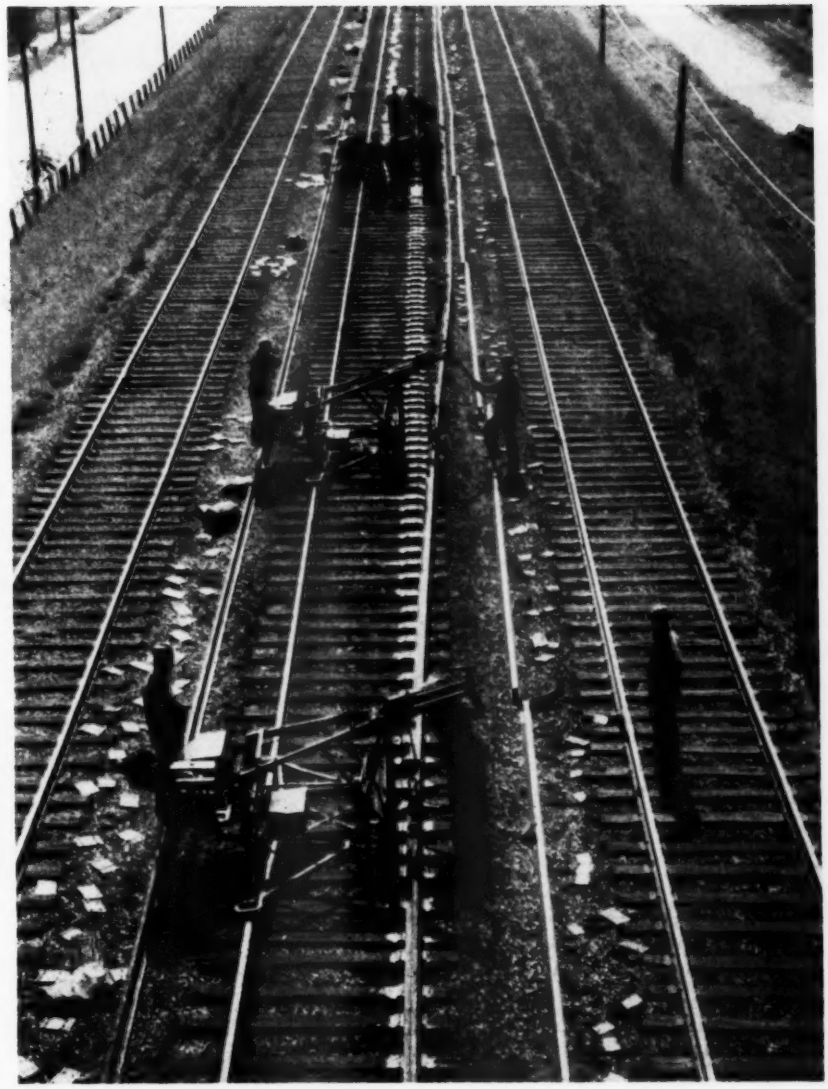
HOW
Meco machines helped lay 10½ miles of "ribbonrail"

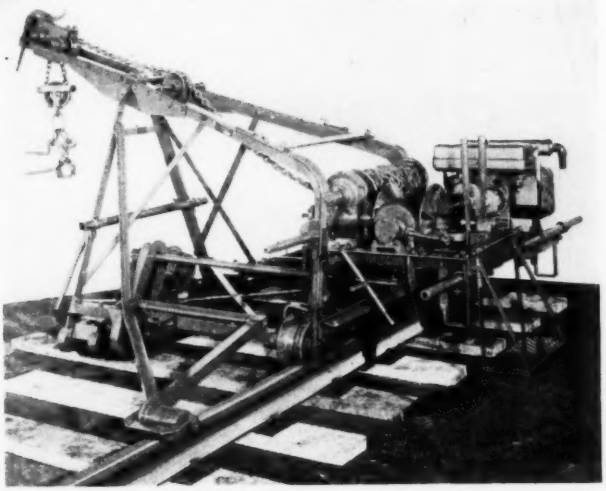
When the C & N W recently relaid a 10½-mile stretch of high-speed track with 115 # rail in continuous welded lengths from 546 ft. to 741 ft., two Type C Meco Power Rail Layers were used. The machines worked as a pair, about 39 feet apart, lifting the rail from the edge of the roadbed where it had been delivered, and setting it down in position on the tie plates.

The improved low-cost light-weight high-capacity Type C Meco Power Rail Layer is self propelled on the job, mounting a fixed boom on a frame with two double-flanged wheels to run on track rail on one side, and a crawler mechanism to run on ties on the other.

Let us furnish you complete information on the improved Type C Meco Rail Layer.



Maintenance Equipment Company
RAILWAY EXCHANGE BUILDING • CHICAGO 4, ILLINOIS



TYPE C MECO RAIL LAYER

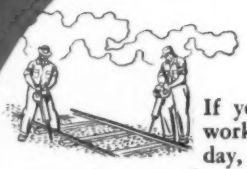
Operator pays out hoisting chain which is attached to rail by tongs man. After rail is lifted, tongs man trips dog at end of boom causing carriage to roll down and bring rail in position above tie plates. Self-locking hoist keeps load from slipping as rail is brought in to gauge and lowered to contact with heel of previously laid rail. Power is supplied by a 10-h.p. 4-cycle gasoline engine; friction cone drives eliminate need for clutches and give smooth operation.

LAYS THE HEAVIEST RAIL IN LESS THAN A MINUTE

5471

YOUR **EXTRA EMPLOYEE** THAT WORKS WITHOUT PAY

RACINE *Unit* TIE TAMPER



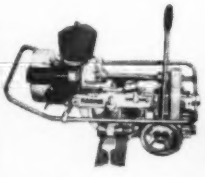
If you had an extra man working eight hours per day, you'd notice the increase in tamped track. A Racine Unit Tie Tamper provides that increase — GIVING YOU THE EQUIVALENT OF EIGHT HOURS MORE WORK EVERY DAY.

Racine Unit Tie Tampers speed up your work and increase manpower efficiency by reducing fatigue. Easily carried, easily operated, shock-free — they team up productively with your operators.

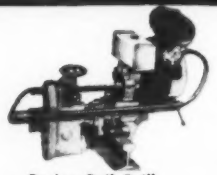
You get longer tool life with less machine maintenance, more uniformly compacted ballast that remains properly placed longer. All these are extras that make the Racine Unit Tie Tamper a valuable employee to serve you capably for a long, long time. Write for free 3-color catalog.

- LIGHT IN WEIGHT (60 lbs.)
- SHOCK-FREE OPERATION
- 1500 BLOWS PER MINUTE
- EASY STARTING MAGNETO IGNITION
- BALANCED RECOIL—SMOOTH ACTION
- LOW MAINTENANCE COST
- 80% IMPROVEMENT IN TOOL LIFE
- LONG TROUBLE-FREE LIFE

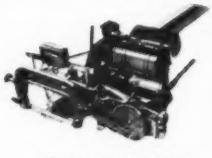
OTHER PORTABLE MACHINES BY RACINE



Racine Bond Drill



Racine Rail Drill



Racine Rail Cutter

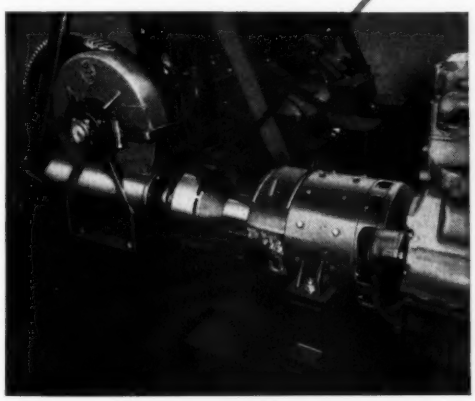
RACINE

TOOL AND MACHINE COMPANY

1738 State Street, Racine, Wis.

NOW STANDARD ON BROWNHOIST LOCOMOTIVE CRANES . . .

new dyna-matic clutch



142-A

For Smooth, Acceleration, and Control of Hoist, Rotating and Travel

The new, electrically operated DYNAMATIC CLUTCH, available as standard equipment only on Brownhoist Diesel Electric locomotive-cranes, provides a smooth, responsive flow of power never before possible with the usual disc or mechanical clutch for transmitting power to the machinery of a crane. The DYNAMATIC CLUTCH is essentially a driven rotor revolving on anti-friction bearings within a rotating coil energized by a small flow of current from the starting battery. The new DYNAMATIC CLUTCH has a 32-step control. Power response is steady and sensitive. Loads may be raised, lowered, or rotated smoothly and accurately without the use of mechanical brakes. Torsional impulse and vibration from the power source is completely eliminated. The DYNAMATIC CLUTCH provides a cushion between the engine and crane machinery. When clutch is fully engaged there is no appreciable slippage. Since there is no contact between the revolving field and armature, there is no friction between moving parts nor drag between the parts when the controller is in the off position — no parts need replacement other than inexpensive brushes. The new DYNAMATIC CLUTCH is one more good reason it pays to buy a BROWNHOIST.

BROWNHOIST

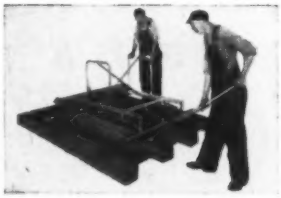
INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN • DISTRICT OFFICES: New York, Philadelphia, Pittsburgh, Cleveland, San Francisco, Chicago, Canadian Brownhoist Ltd., Montreal Quebec. **AGENCIES:** Detroit, Birmingham, Houston, Los Angeles.

One Hundred Years of Progress

WHEN the first Illinois Central tracks were laid across the prairies, all work had to be accomplished by hand labor. Now the modern economies and efficient performance of mechanized maintenance equipment are utilized to keep the 6543 road miles of Illinois Central tracks sound and safe. In this continuous project maintenance forces are helped by WOOLERY Tie Cutters and other WOOLERY maintenance equipment.

The WOOLERY Tie Cutter provides a proven money-saving method of removing old ties without trenching, jacking up track, or adzing tops of rail-cut ties.

The WOOLERY Tie Cutter and Undercarriage enables one man to quickly cut each worn tie into three easily-removable pieces which can be lifted out without disturbing the ballast, so that new ties can be reseated on a firm bed. With this modern machine the entire cutting operation is performed without lifting or turning, by traveling the cutting mechanism across the undercarriage to cut both ends of the same tie, and rolling the whole apparatus along the rails to successive tie positions. Total cutting time per tie is less than two minutes.



The WOOLERY Tie Plate Spacer speeds rail laying by quickly locating single or double shoulder tie plates at exact position on ties. Rugged, yet light in weight, one man can easily handle it on or off track, yet it will stand up in hard daily service.

Pioneer Manufacturers of Railway Maintenance Equipment Since 1917

WOOLERY MACHINE COMPANY

MINNEAPOLIS MINNESOTA

Pioneer Manufacturers of RAILWAY MAINTENANCE EQUIPMENT

RAILWAY WEED BURNERS • MOTOR CARS • FLANGEWAY CLEANERS • TIE CUTTERS • TIE PLATE SPACERS • RAIL JOINT OILERS • CREOSOTE SPRAYERS

EXCLUSIVE EXPORT REPRESENTATIVES: PRESSED STEEL CAR COMPANY, INC., NEW YORK, N. Y.

MODERN high-speed railway transportation places a heavy burden on those responsible for greater railroad safety. Pittsburgh is happy to be able to contribute to the solution of this important problem with SNOLITE White Paint.

● **Pittsburgh SNOLITE** is a specially prepared fume-proof white paint for crossing gates, signs, fences, cattle guards and for all other places where top visibility is of utmost importance.

● **Accurate shop** and field tests have been made by many railroad systems, under varying conditions and over long periods of time. They have proved conclusively that Railroad SNOLITE not only has greater coverage and unequalled opacity, but that its use also reduces maintenance costs.

● **These tests** have shown that SNOLITE possesses greater whiteness—even when exposed to extremely severe weather conditions, it stays white and affords more complete protection for a longer time. Its self-cleaning properties remove surface dirt. Its lead-free pigmentation will not darken or discolor from the sulphurous fumes of coal smoke, industrial gases or polluted rivers and streams.

● **Write today** for Pittsburgh's free folder which explains fully the unusual properties and advantages of Railway SNOLITE and suggestions for its use.

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CARHIDE—for wood and metal freight cars of all types.

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SNOLITE—white fume-proof paint for signs, crossing gates, fences and cattle guards.

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PITTSBURGH PLATE GLASS COMPANY

What's the best way...

to cut rail cropping costs

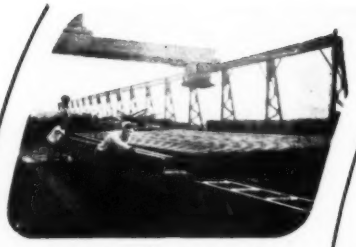
by portable field units? ...or fixed installation?

Both are excellent!... but, many roads find that a centrally located rail cropping plant usually lends itself to a more efficient and economical operation.

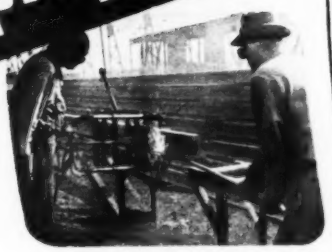
With a fixed installation, the work can be set up on a continuous production basis... rails can be collected at a central point, and the road can realize the full capabilities of specialized workmen.

As shown in the accompanying photographs, rail cropping is simple, easy and quick. The Airco developed rail cropping machine employs two highly efficient, oxyacetylene flame cutting tips, which cut rails of any size, making as many as 25 cuts an hour, and producing a surface that requires a minimum of grinding.

For further information, write your nearest Airco office.



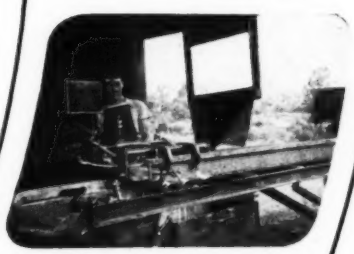
...conveying the rail to the cropping machine.



...making the bottom, or backward, cut. (Note: This machine is portable and can be transported to the right-of-way, if so desired.)

...cropped rail, showing cut quality.

...finishing the cut end.



...drilling bolt holes in rail end.

COSTS COME DOWN UNDER THE AIRCO PLAN

AIRCO

AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY
AIR REDUCTION PACIFIC COMPANY
REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
Divisions of Air Reduction Company, Incorporated
Offices in Principal Cities

For additional information, use postcard, pages 103-104

Important Information FOR RAILWAY EXECUTIVES

WHO WANT WEED-FREE TRACK AT REASONABLE COSTS...

Are you satisfied with temporary top-kill with no reduction in yearly costs?

Or do you want—

Cumulative control with clean track at higher initial cost but with diminishing annual expenditures?

The Choice is Yours!

OUT OF ITS EXTENSIVE BACKGROUND in handling railroad weed control problems, General Chemical has developed a *modern* method of control which now enables a road to achieve clean track immediately with continuous reduction in root growth . . . and at *diminishing costs!*

THESE RESULTS are obtained through a two or three year program, following a schedule *especially tailored* to overcome each road's particular weed problems.

IN RESPONSE TO the dozens of requests for a detailed definition of this program . . . how it works . . . and what it does, a descriptive portfolio, "A Policy Decision in Railroad Weed Control", has just been published. Outlining General's proven method of treatment, it supplies you with answers to the above questions. A supplement contains full color illustrations showing the clean track obtained for several leading roads through the use of this program.

IF YOU feel a copy of this portfolio would be helpful in making your policy decisions in railway weed control, *please write today on your business letterhead to:*

GENERAL CHEMICAL WEED CONTROL

WEED KILLER DEPARTMENT

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

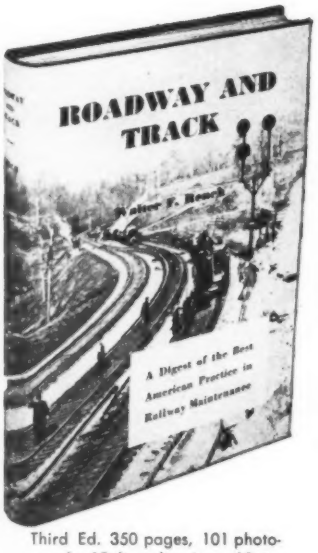
40 Rector Street, New York 6, N. Y.

For additional information, use postcard, pages 103-104

A Handbook of
Modern Track Work

ROADWAY AND TRACK

By Walter F. Rench
Formerly Supervisor on the Pennsylvania Railroad;
Author of Simplified Curve and Switch Work



Third Ed. 350 pages, 101 photographs 19 line drawings, 12 tables, index, 6 x 9, cloth, $5.00.

The third edition features the use of the latest mechanical equipment in connection with roadway and track maintenance. Older methods employed where full mechanical equipment is not available are also explained. While most of the methods described are those which are standard on the **Pennsylvania**, A.R.E.A. recommended practices and those in use on other well maintained roads have also been included.

Outstanding types of mechanical equipment used in track work are described and illustrated with action photographs. Engineering drawings show working details. The economies resulting from the adoption of modern methods are clearly outlined. Useful tables have been added to make the book suitable for reference use, as well as a practical handbook on modern methods.

CONTENTS

Part I—ROADWAY: Essential Elements in Roadway Maintenance—The Right of Way—Drainage of Roadbed and Track—Vegetation for Banks—Economics of Roadway Machines—Labor Saving Methods and Devices in Roadway Work—Small Tools and Their Uses.

Part II—TRACK: Essential Elements in Maintenance of Track—Program for Maintenance of Way and Structures Work—The Track Obstruction—Power Machines and Equipment—Labor Saving Methods in Track Work—Track Materials and Their Uses—Practice in Rail Renewals—Practice in Rail Repair and Inspection—Maintenance of Main Tracks—Maintenance of Yards and Terminals.

Part III—SPECIAL PROBLEMS AND DUTIES: Maintenance Problems and Methods Used—Economics of Track Labor—Special Duties in the Maintenance of Way Department.

SUPPLEMENT: A 10-page Supplement describing new A.R.E.A. recommendations and changes up to July 1, 1948, can be cut for insertion in proper place.

Send For Your Copy Today

Send for a copy today and see how it will help you improve your knowledge of your work.

TRACK SUPERVISORS

While written primarily to serve the needs of track supervisors and other maintenance officers, it contains material of considerable interest to transportation and mechanical officers who require a working knowledge of the fundamentals of maintenance of way practice. Section and extra-gang foremen, who wish to acquire a broader knowledge of their work will find it particularly helpful.

— - Ten Days Free Examination Coupon - —

Simmons-Boardman Publishing Corporation
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Please send me on Ten Days Free Examination a copy of the Third Edition of ROADWAY AND TRACK by Walter F. Rench. If satisfactory, I will remit the list price of $5.00. Otherwise, I will mail the book back postpaid, without obligation.

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R. E. & M. 2-51

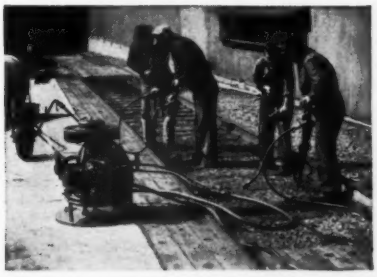
New 36 cfm

Ingersoll-Rand SPOT-AIR 3R-36

. . . a 4-Tool Air Compressor for Maintenance of Way

Ingersoll-Rand now offers the 3R-36 SPOT-AIR as the lightest, most compact section-gang compressor of its kind. The self-contained arrangement of three power cylinders and three air cylinders mounted radially around a vertical crankshaft gives a smooth conversion of engine torque into air power.

This versatile air power unit is completely air-cooled thus permitting operation in any kind of weather with no danger of freezing or overheating. The SPOT-AIR stands only 32 inches high on a 27 inch diameter baseplate, making it ideal for between-track work. See your nearest Ingersoll-Rand representative for the full story on the 3R-36 SPOT-AIR.



Big enough **to operate four I-R tie tampers**

Light enough **to be handled by two men**

Rugged enough **to take a lot of punishment**

- **36 cfm free air delivery at 80 psi**
- **Weighs only 265 lb . . . less than any compressor of its type**
- **Extremely portable with wheelbarrow mounting**

Other IR *Air Power equipment for maintenance of way*

SPIKE DRIVERS	WOODBORERS	BACKFILL TAMPERS
GRINDERS	RIVETING HAMMERS	PAVING BREAKERS
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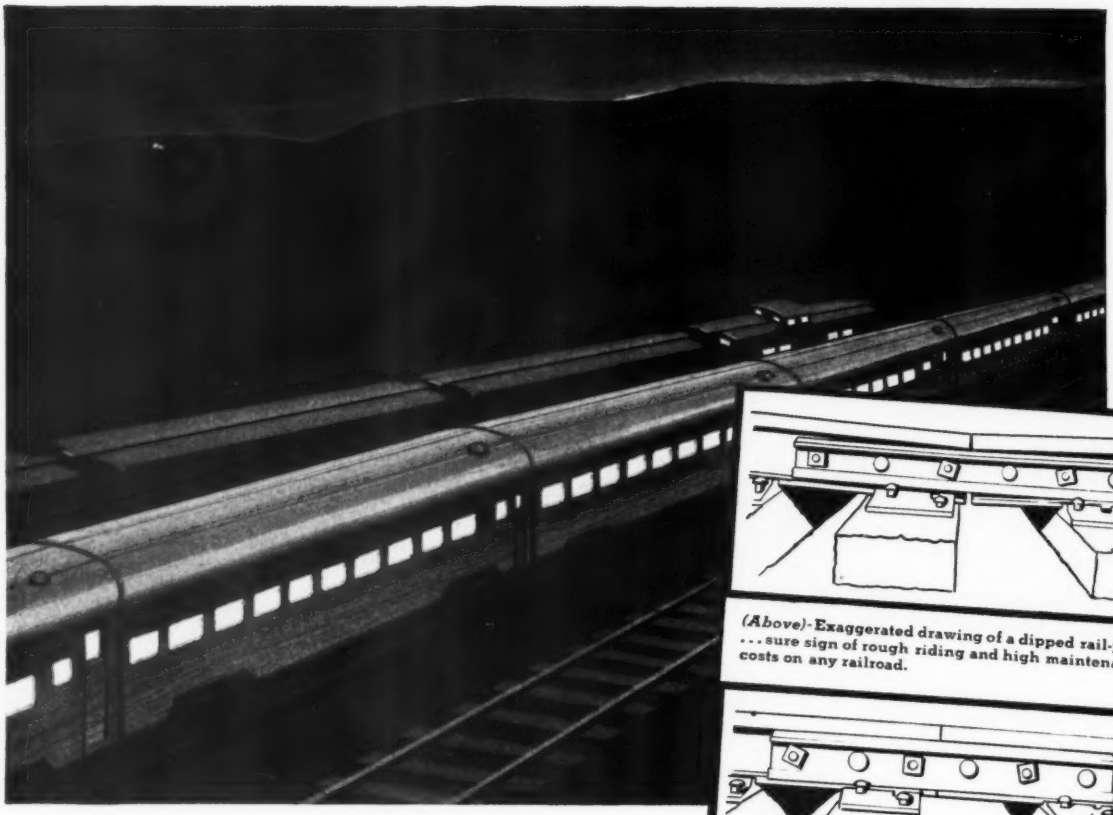
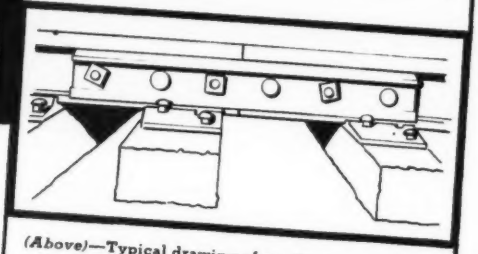


(Above)-Exaggerated drawing of a dipped rail-joint . . . sure sign of rough riding and high maintenance costs on any railroad.



(Above)—Typical drawing of a rail-joint brought to exact level *to stay* with the individually operated tamping arms of the Matisa Tamper.

(Below)—Tamping shoes of Matisa Tampers *do not* pound ballast to powder—vibratory pressure action compacts ballast *under* ties, as well as at sides.

SMOOTH RUNNING ON *Matisa*-TAMPED JOINTS

LEVEL track and smooth joints speed schedules, save track and equipment maintenance, make passengers rail travel boosters . . . And this is the track you get with Matisa precision tamping . . . The only power tamper available that compacts while vibrating *under ties* for level joints and rails that *stay level.*

Write to our M. W. Engineering Department for full details.

THE MATISA EQUIPMENT CORP.
224 South Michigan Blvd. • Chicago 4, Illinois

ALL OVER THE WORLD
Matisa TRACK MAINTENANCE SPECIALISTS

SPRAYING Nalco H-170-B from Illinois Central Spray Car in the Illinois Central Yards, New Orleans, Louisiana. Note tall, hard-to-kill grass.

AFTER Nalco H-170-B [illegible] weeds and grasses reached by the [illegible] spread. H-170-B will also inhibit regrowth for [illegible].

Nalco H-170-B
WEED and GRASS CONTROL
Controls Tough Johnson and Bermuda Grass on the ILLINOIS CENTRAL

TOUGH, hard-to-kill grasses, such as Johnson and Bermuda grasses, are controlled with Nalco's powerful new formula, H-170-B. Combined with its top killing action, H-170-B penetrates extremely rapidly and causes extensive root-kill which cuts down regrowth to a great extent.

Despite its potent weed-killing action, H-170-B is safe to use where livestock may be grazing, and it will not contaminate water supplies. Low volatility makes storage safe and eliminates fire hazards while spraying. Application may be made with any type of sprayer.

Full details on Nalco Weed Control and the availability of Nalco Spray Cars is available promptly from your Nalco Representative, or direct from Nalco.

Congratulations
to the
ILLINOIS CENTRAL
on
100 YEARS
of
PUBLIC SERVICE

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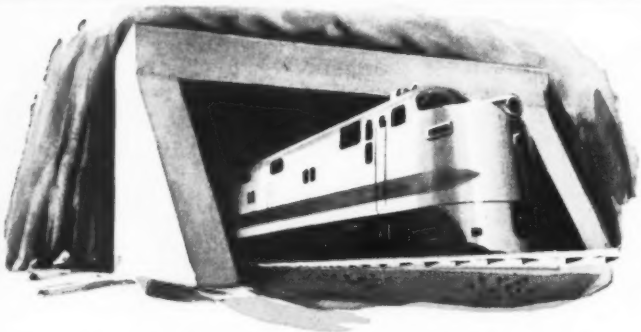
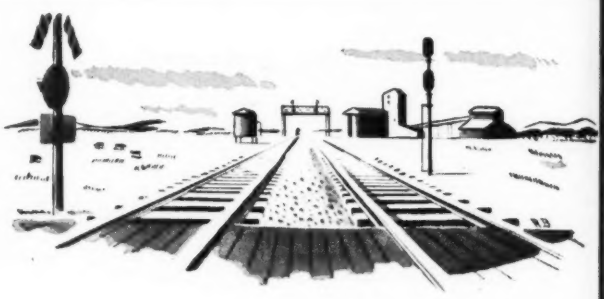
THE Nalco SYSTEM . . . Serving the Railroads through Practical Applied Science

HOW TO STOP EXCESSIVE RAIL

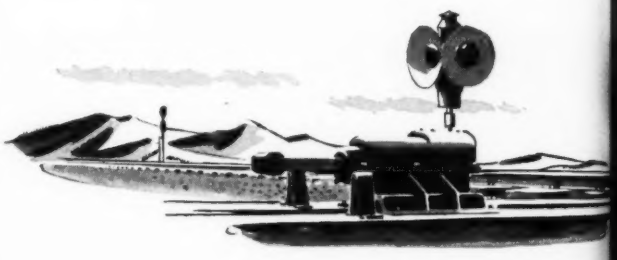


TUNNEL ACIDS and MOISTURE, notoriously rough on rails, cause excessive corrosion and shorten rail life. Now you can protect tunnel track by coating with tough, corrosion-resistant R-M Rust-Chek. Especially formulated to resist sulphuric acid fumes and moisture. Won't peel or chip.



GRADE CROSSING PLANKS trap water and winter road salts around rails. R-M Rust-Chek protects rails from salt and water, prolongs rail life. Unusual flexibility resists shock and powerful impact of train wheels. Flexibility and adhesion are retained even during severely cold winter periods.

prolong
rail life



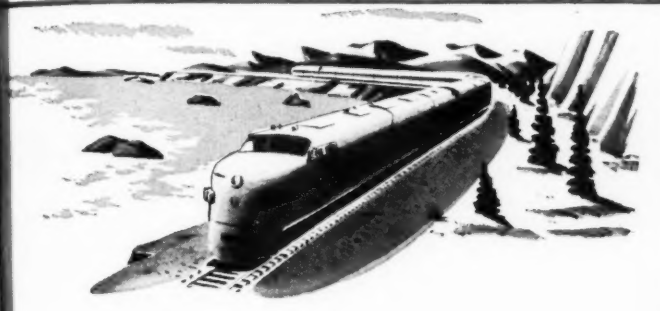
WRITE NOW FOR DESCRIPTIVE BROCHURE and full details of railway field applications and accelerated laboratory tests made with R-M Rust-Chek. Included is a review of Rinshed-Mason scientific developments in the field of protective coatings for industry.

WITH . . .

RUST ✓ CHEK

CORROSION-RESISTANT RAIL COATING

corrosion



SALT WATER SPRAY bites into track running close to sea shore or salt water areas; cuts many years of life from costly steel rails. R-M Rust-Chek resists damaging salt spray; prevents corrosion caused from refrigerator-car brine drippings. Excellent adhesive qualities and abrasive resistance.

BRIDGES and other structural steel work, especially those which may be subjected to corrosive elements or severe atmospheric conditions, need the positive protection that R-M Rust-Chek affords. This smooth-flowing finish requires no special equipment; can be easily brushed, sprayed or dipped.

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No. 266 of a series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION
79 W. MONROE STREET
CHICAGO 3, ILL.

Subject: Our Extra-Curricular Activities

February 1, 1951

Dear Readers:

Many of you are aware of the fact that the editors of this magazine are active in the affairs of the various associations and clubs comprised of railway engineering and maintenance officers. In this letter I should like to discuss these activities and to explain the considerations that lead us to devote so much time and effort in the interests of organizations other than the one on which we depend for a livelihood.

For many years present and former members of our editorial staff have been active in the affairs of such groups as the American Railway Engineering Association, the Roadmasters and Maintenance of Way Association, the American Railway Bridge and Building Association, the Maintenance of Way Club of Chicago, and the Metropolitan Maintenance of Way Club (New York). Since a detailed account of the nature and extent of these activities would require a great deal more space than is available here I will try to summarize them as briefly as possible.

In the first place members of the staff are now serving in elective positions in several of these groups. In nearly all of them they are also serving as chairmen or members of committees for arranging programs, for conducting membership drives, for making hotel arrangements, and for publishing association proceedings and news bulletins. In this latter connection our editors have for some years edited the proceedings of the Roadmasters' Association and the Bridge and Building Association and have assumed the major responsibility of preparing the news bulletins that are issued periodically to the members of these two associations. In addition, names of our staff members will be found on the rosters of several standing committees of the A.R.E.A. and on those of technical committees of the other associations.

These extra-curricular activities are taken seriously by our staff. They naturally require a great deal of time, both during and outside of office hours, but this time is freely and gladly given, even though some personal sacrifice is sometimes involved. Many times it has happened that regular staff assignments have been laid aside temporarily while some work of an urgent nature is done for one of these associations. However, we feel that we are more than repaid for the time and effort spent in association work. In the first place we are grateful for these opportunities to serve the field with which our interests are so closely identified. Second, they are a means whereby our editors are enabled to make innumerable contacts, under favorable circumstances, with engineering and maintenance officers of all ranks. You would be surprised to know how many ideas for articles and editorials develop out of these contacts.

Yours sincerely,

Merwin H. Dick

MHD:ag

Editor

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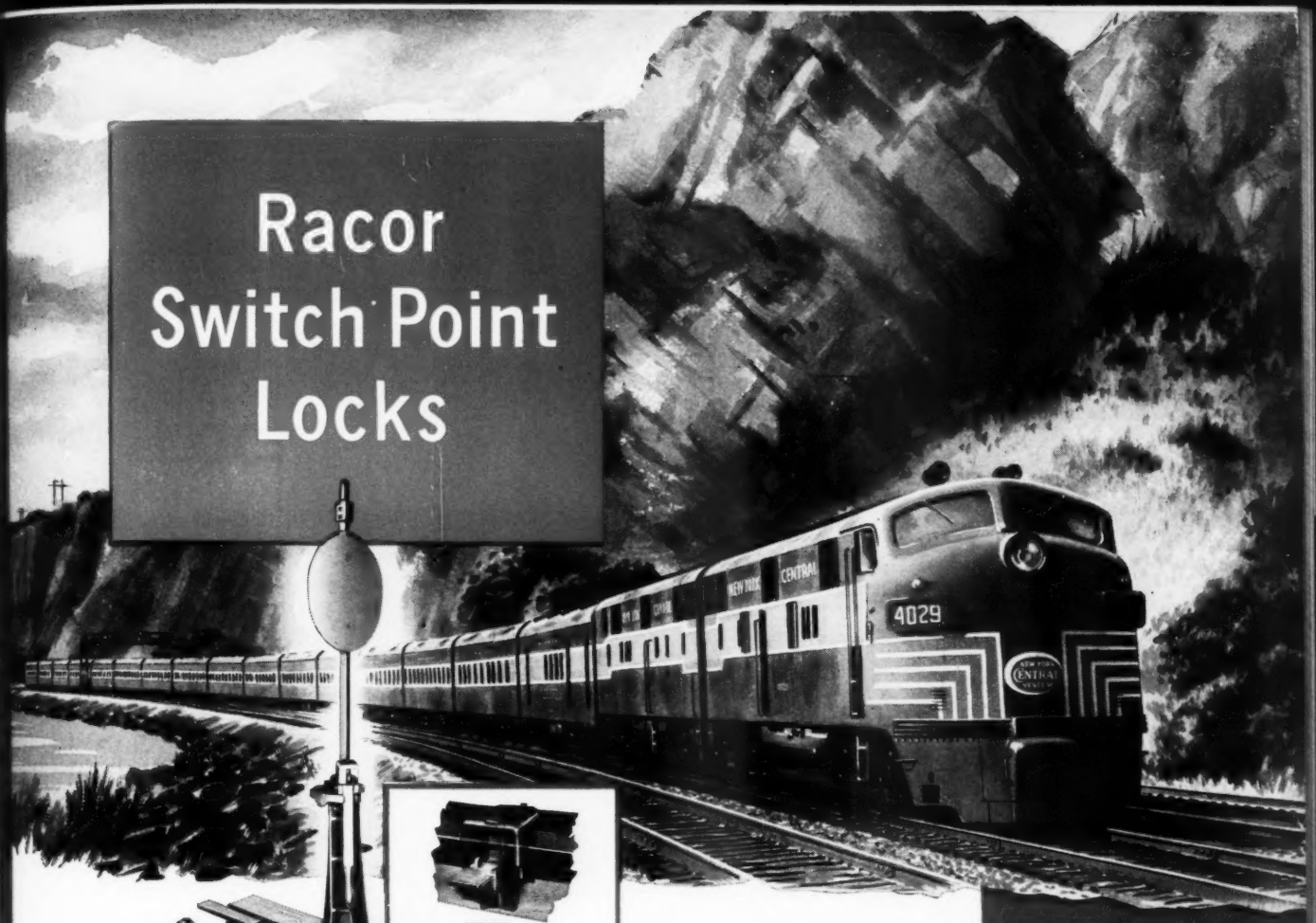
Racor Switch Point Locks



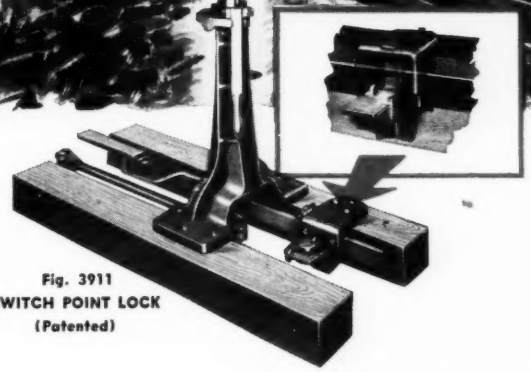


Fig. 3911
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Fig. 3911 (illustrated) for use with all types of column throw stands.
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WHY ASK THE BRANCH LINE SUPERVISOR?

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The Public —

Has Strange Way of Showing Appreciation

There is hardly anybody who will disagree with the statement that a strong, independent rail transport system is essential to the national defense. Quite probably even the operators of highway trucks will subscribe to this statement, but that does not prevent them from doing everything they can to take business away from the railroads, even if it means a weakening of the carriers' ability to handle the country's transportation requirements during wartime.

In a recent statement Major General Charles P. Gross, former chief of the Transportation Corps, U. S. Army, after recounting the accomplishments of the railroads during World War II, said that "as a result, there is a deeper appreciation by the public than ever before of the essential role the American railroads play in our national life." "It was widely felt before the war," he went on, "that the railroads were being displaced by our motor highways and our inland waterways. But when the war came, what happened? More than 90 per cent of the War Department traffic moved by rail, scarcely 9 per cent by highway, and the small remainder by inland waterway. No better proof, it would seem, was needed to show that our railroads are essential to our national defense, and that they must be maintained in a high state of efficiency."

What General Gross meant by the last statement is that the railroads should be maintained to a high state of efficiency *at all times*, both in wartime and during the interludes of peace between wars. To make this possible it is necessary that they carry in times of peace a volume of traffic sufficient to insure a reasonable return on their investment while permitting the carriers to make the expenditures necessary for maintaining and improving their properties as required by the needs of national defense. There is, of course, no way of guaranteeing the railroads a volume of traffic adequate for this purpose, but it would help greatly if competing forms of transport were to stop receiving subsidies and the benefits of unfair regulatory practices.

Although the public, as General Gross states, may have a deeper appreciation than ever before of the role of the American railroads, it has failed to express this sentiment in a tangible form. In 1939 the railroads transported 63.3 per cent and the truckers 8.1 per cent of the total freight ton-miles of intercity traffic carried in the United States. During the war, when gasoline rationing and the shortage of rubber put a damper on trucking operations, the percentage of the total traffic carried by the railroads rose above 70 and that carried by the trucks dropped below 5. Following the war's end, however, while the public, with its newly-acquired "appreciation" of the railroads, stood by, the process of attrition again got under way. By 1949, the latest year for which figures are available, the railroads' percentage of the total traffic carried was down to 61.5, while that of the trucks had risen to 10.5.

If the present international crisis was bound to come eventually, it is probably fortunate that it came as early as it did. If much more time had elapsed it is not unlikely that the effects of unfair competition would have been an important factor in the weakening of the railroads to the point where they could not have fully met the transportation requirements of the country in an emergency. That would indeed be a triumphant day for communism.

GRADE CROSSINGS—

Like Highways, Must Take Heavy Abuse

THE Inter-Regional Council on Highway Transportation recently announced the preliminary findings of a series of tests conducted on separate sections of a modern two-lane concrete highway in Maryland for determining the damaging action of overloaded trucks. It appears that a truck having a single rear axle and an 18,000-lb. load, in making 238,000 passes in six months of testing, damaged 28 per cent of the slabs. A truck having tandem rear axles and a 32,000-lb. load, after 92,100 passes over a period of four months, damaged 27 per cent of the slabs, while 64 per cent of the slabs, were damaged after six months testing and 238,009 passes. After four months' testing and 92,100 passes with another tandem rear-axle truck having a 44,800-lb. load, the tests were discontinued because 96 per cent of the slabs were badly damaged.

Already the American Trucking Association, asserting that the foundation under the test road was poor and washed out, has stated that these tests prove nothing. However, the preliminary findings have prompted one state governor (Ohio) to send a message to his legislature recommending that the trucks be taxed, in addition to the usual license fee, on the basis of ton-miles of freight hauled. The State of Maryland is giving consideration to similar action.

While this news is heartening to railroad men, as it indicates that trucks may soon be placed on a more equitable competitive basis in some states, there is another aspect of this subject that is of particular interest to railway maintenance men. One question is whether, in view of the damaging action of heavy trucks, the railroads should continue to bear the entire expense of maintaining highway-railroad crossings. Also it is pertinent to raise a question as to what might be done to improve the designs of such crossings so that they will better withstand the heavy loads imposed by both rail and highway traffic.

Vast expenditures have been made by the railroads to construct durable and smooth-riding highway grade crossings, and the best engineering know-how has been devoted to this end. However, while good vehicular traffic surfacings of bituminous products, sectional metal plates and castings, creosoted black gum, and armored concrete slabs, as well as monolithic concrete crossings, are presently available, the service life being obtained in some cases still leaves something to be desired.

But the problem of getting more service life from crossings is being gradually solved by initiative and ingenuity, particularly by the men responsible for the maintenance of the crossings. For instance, one engineer found that the chewing of the tops of the ties by concrete slabs in crossings was hastening the deterioration of both the ties and the slabs. The installation of rubber pads stopped this action. Recognizing the existence of latent inventiveness among its men, one railroad is making a canvas of its division engineers to learn what means are being used on their respective territories to prolong the life of highway crossings and the results being obtained. Perhaps such a canvas by more railroads is in order to develop better crossings.

WORK EQUIPMENT—

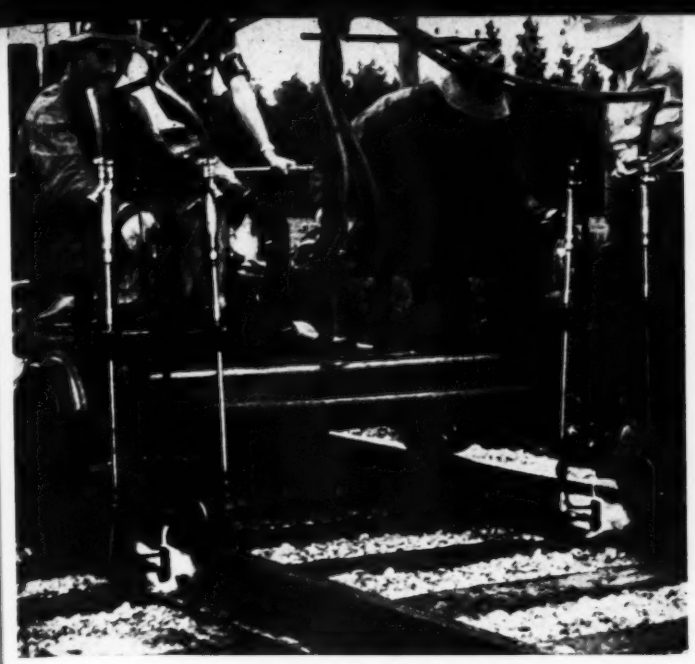
When Should It be Serviced or Repaired?

OF ALL the factors affecting the amount and quality of maintenance work to be completed in this year of special need, none will have more significance than the productivity of work equipment. In turn, that productivity will depend to a great extent, upon the degree to which equipment will be in constant readiness to perform all work to which it may be assigned—and to continue to perform it without interruption for as long as required. The effectiveness of work equipment has become so much a part of normal maintenance that these statements would seem not to need repetition. There is danger, however, that daily use of equipment might lead maintenance men to take its continuing productivity for granted.

These men can avert this danger by taking stock of the equipment-use "habits" in vogue on their respective roads by asking themselves the following questions: (1) How long do gangs have to wait in the morning before the equipment is ready for use? (2) Is any attention being given to "resting" equipment on that all-important sixth day of the week? (3) Are machines truly given "preventive maintenance?"

It might help, here, to review the answers an inquiring contractor got to similar questions and what he did about them. He found that the time lost waiting for his equipment to be "gassed", greased and warmed up in the morning was too astounding to be condoned. His solution was to establish a night-servicing crew, furnished with a truck equipped to deliver oil, fuel and lubricants to each piece of his equipment so that it was ready for work at the gang's starting time. This servicing crew was also instructed to make minor repairs when necessary. Where the number of machines to be serviced did not warrant the use of this crew, machine operators were ordered to report early enough to have their equipment fueled and warmed up by the time other men appeared on the job. Needless to say, production soared. Such night-servicing crews may not, in all cases, be practicable in railroad work, but early-reporting operators have proven effective.

However, perhaps even greater advantages can accrue from a workable system of preventive maintenance designed to keep equipment running when labor is working by repairing and servicing it at other times. It doesn't matter whether this is accomplished by assigning all repair forces to work on that "idle" sixth day, by staggering such forces, by establishing relief repairmen, or by other means. Regardless of how it is attained, one of the main goals must surely be that any machine needing either a "tune-up" or repairs on Friday night should be given the necessary attention before Monday morning.



Rails are flame cleaned and . . .

sprayed with rust preventive . . .

. . . To Thwart Salt-Air Corrosion

On the Great Northern

Having satisfactorily protected rails in tunnels with a rust-resistant paint, Great Northern engineers extended the practice to rails and fittings attacked by the salty, corrosive atmosphere of the Pacific coast. In doing so they added a new touch—flame cleaning—to provide greater effectiveness at low cost.

• A new, highly-effective, low-cost method of protecting rails, frogs and switches from the corrosive effects of salt air has been developed by the Great Northern for use on its line that skirts the shore of Puget Sound between Everett, Wash., and Vancouver. The method consists essentially of flame-cleaning the rail and fittings with oxyacetylene cleaning heads and subsequently coating them with a corrosion-resistant coating that is flexible and is reported to have high adhesive qualities that resist cracking, chipping and peeling. The successful accomplishment of these two operations required the building of a "flame cleaner" from an old motor car and the slight alteration of a joint spray machine to apply the rust preventive.

The flame cleaner was constructed from a motor-car frame by adding reconditioned wheels, axles, bearings and a hand-propelling mechanism; by hinging two flame-cleaning heads to the motor-car frame over each rail in such a way that they can be shifted to clear rail anchors and angle bars and lifted to clear crossings; and by adding seats and hand rails for the convenience and safety of the operators.

How Unit is Propelled

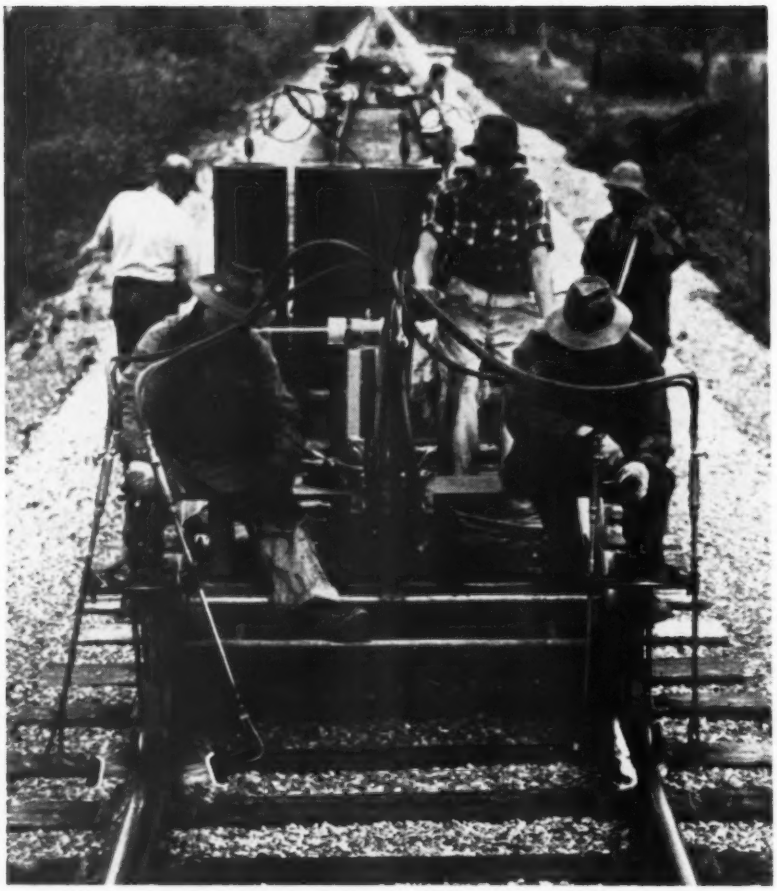
The hand propelling mechanism is mounted on a bracket directly above the rear drive axle of the car. It is so constructed that hand power, applied to a handle on the rim of a fly wheel, is transmitted to a drive sprocket on the fly-wheel axle and thence through a sprocket chain to another drive sprocket on the car's axle. By means of this mechanism one man can easily apply enough power to move the car steadily forward, towing a trailer car loaded with oxygen and acteylene tanks to supply the flame-cleaning burners.

Two flame-cleaning attachments, each consisting of a system of brackets and supports, are hinged to the front of the car, one over each rail. The upper support of each bracket holds an oxyacetylene blowpipe in a vertical position on each side of the rail over which it is located. Flame-cleaning burner heads of the 90-deg. type are attached to each blowpipe and turned toward each other.

When either of the hinged brackets to which blowpipes and burners have been attached is lowered into working position, the whole assembly is supported on the running rail by a dolly wheel. In this position the burner heads are centered on the inside and outside webs of the rail and by means of their U-shape direct the flames perpendicular to the surface of the rail to be cleaned, including the under side of the head, the web and the top of the base.

Burner Heads Moved by Levers

One of the features of each flame-cleaning attachment is the system of three levers by which the burner heads can be moved to clear obstructions. These levers are located at the level of the upper support within easy reach of the operator. Operation of one lever lifts the inside burner free of



rail anchors; a second lever swings both burners outward to clear angle bars; and the third is used to lift both heads above crossings and turnout rails, and to place the machine in a traveling position. When the burners are lifted to the traveling position a sliding pipe is moved under each of them to support it while being transported to and from the job.

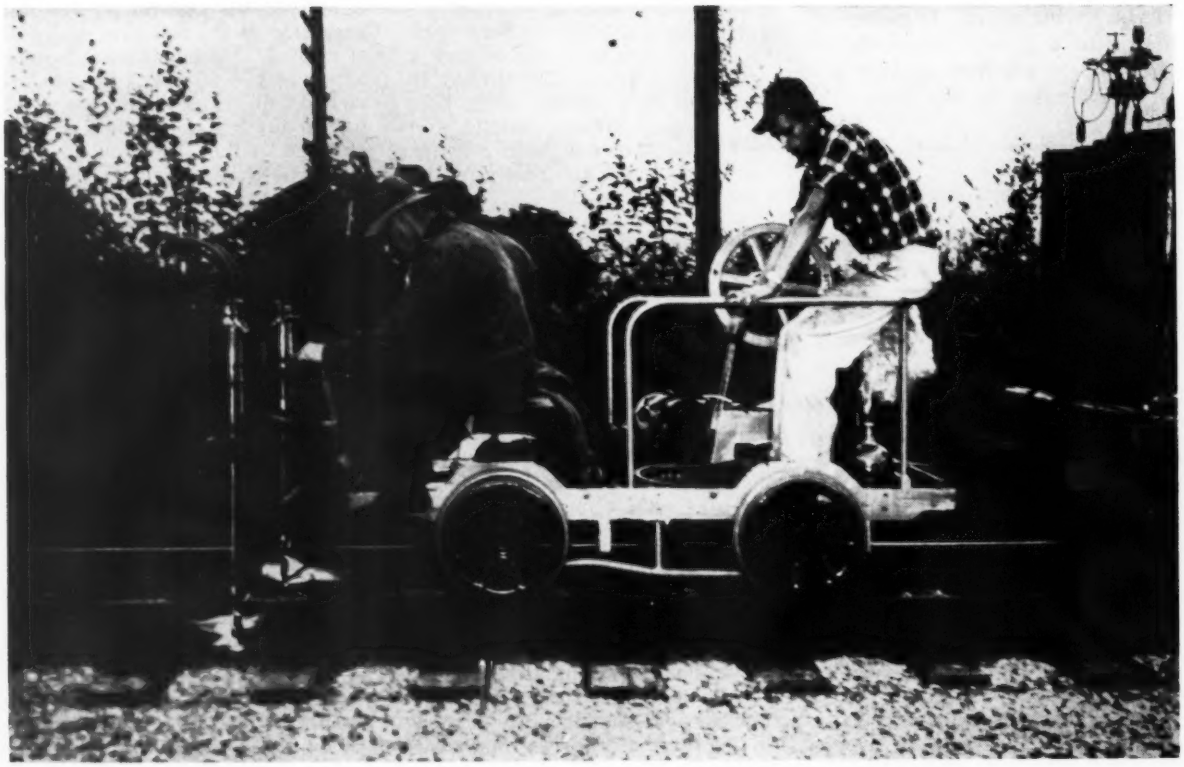
Fuel for each pair of burners is supplied from two oxygen and four acetylene cylinders are carried on a trailer car towed behind the flame cleaner. Two acetylene cylinders are manifolded together to serve each pair of burners, while a single tank furnishes the oxygen requirements of two burners.

Organization and Operation

This equipment was originally built to provide corrosion protection to 11½ mi. of new 115-lb. rail and 10 switches just north of

Left—Flame-cleaning heads are hinged to the motor-car frame so that they can be shifted to clear rail anchors and joints, and lifted to clear crossings

Below—The propelling mechanism is so constructed that one man can easily apply enough power to move the car steadily forward, towing a trailer car loaded with tanks of oxygen and acetylene



Everett, Wash., between Marysville and Silvana. This rail was laid with 36-in. headfree, toeless angle bars, 1 1/16-in. by 6-in. track bolts, 8½-in. by 12-in. double-shoulder tie plates, ⅝-in. by 6-in. track spikes, and 32 rail anchors per panel. All turnouts had 19½-ft. switch points, under-cut stock rails and No. 11 rigid manganese frogs protected by hook-flange guard rails.

Phases of the Work

The corrosion-protection work was carried out in three progressive phases by an organization of two welders, two welder helpers, one machine operator, eight section laborers and a section foreman. The flame cleaner, manned by the welders and welder helpers, led the procession. The actual operation of this device in burning off the mill scale from the web, top of base, and underside of the head of each rail in one "pass" requires one man to handle each pair of burners, one man to propel the car and trailer and a welder to supervise the operation of the unit as a whole.

The second operation—brushing all burned mill scale and other debris from the rail—is performed by four section men with stiff brooms, one man on each side of each rail. These men follow immediately behind the flame cleaner. The third operation, consisting of applying the rust preventive to the rails, was carried out by two section men and one machine operator using a joint spray machine with special tips which create a flat spray that paints the rail in one movement. Since this machine has only two spray guns, one man sprays the inside of one rail while the other man sprays the outside. After spraying about 100 ft. of track in this manner this unit "doubles" back and sprays the rail on the opposite side for 200 ft. and then repeats the cycle.

The complete operation is supervised by a section foreman and is protected by two section men providing flag protection. Organized and operated in this manner the corrosion-protection unit completed an average of 3,432 ft. of track per day, in spite of being delayed an average of 1 hr. 10 min. per day by trains. The average cost of this protection was $700 per mile, the details of whcih can be noted from the accompanying table.

The corrosion-protection work described in this artcle was carried out under the general direction of H. J. Seyton, chief engineer, and R. R. Manion, engineer maintenance of way. S. J. Solga, district roadmaster, supervised all field operations.

Cost of Building Flame Cleaner

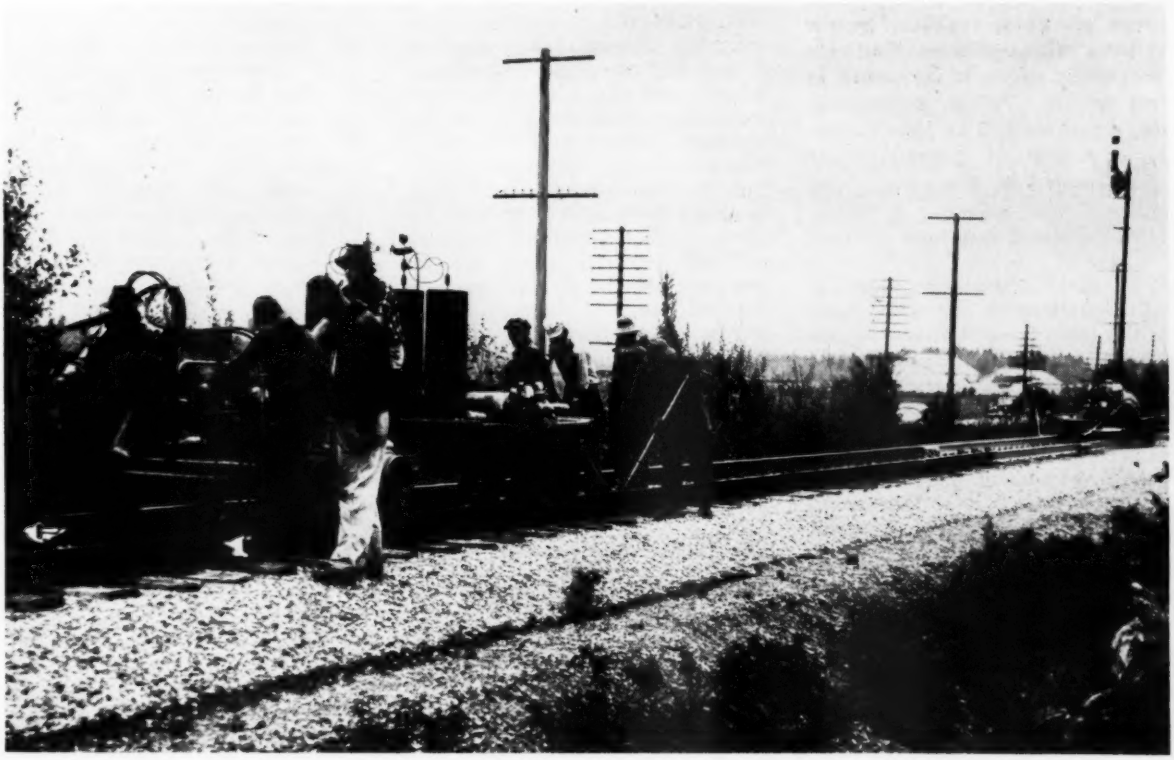
Material	$ 25.75
Labor	144.00
Total	$169.75

Materials Used Per Mile

Primer Coat	66.00 Gal.
Finish Coat	57.39 "
Paint Thinner	35.91 "
Oxygen	728.34 Cu. ft.
Acetylene	1,215.39 " "

Cost of Corrosion Protection Per Mile

Operation	Labor	Material	Total
Flame Cleaning Rail	$110.48	$ 34.37	$144.85
Applying Paint	130.56	424.89	555.45
Total	$241.04	$459.26	$700.30



The flame cleaner is followed by four men who brush burned mill scale from the rails with stiff brooms. Behind them, three men apply rust preventive, using a joint sprayer with special tips

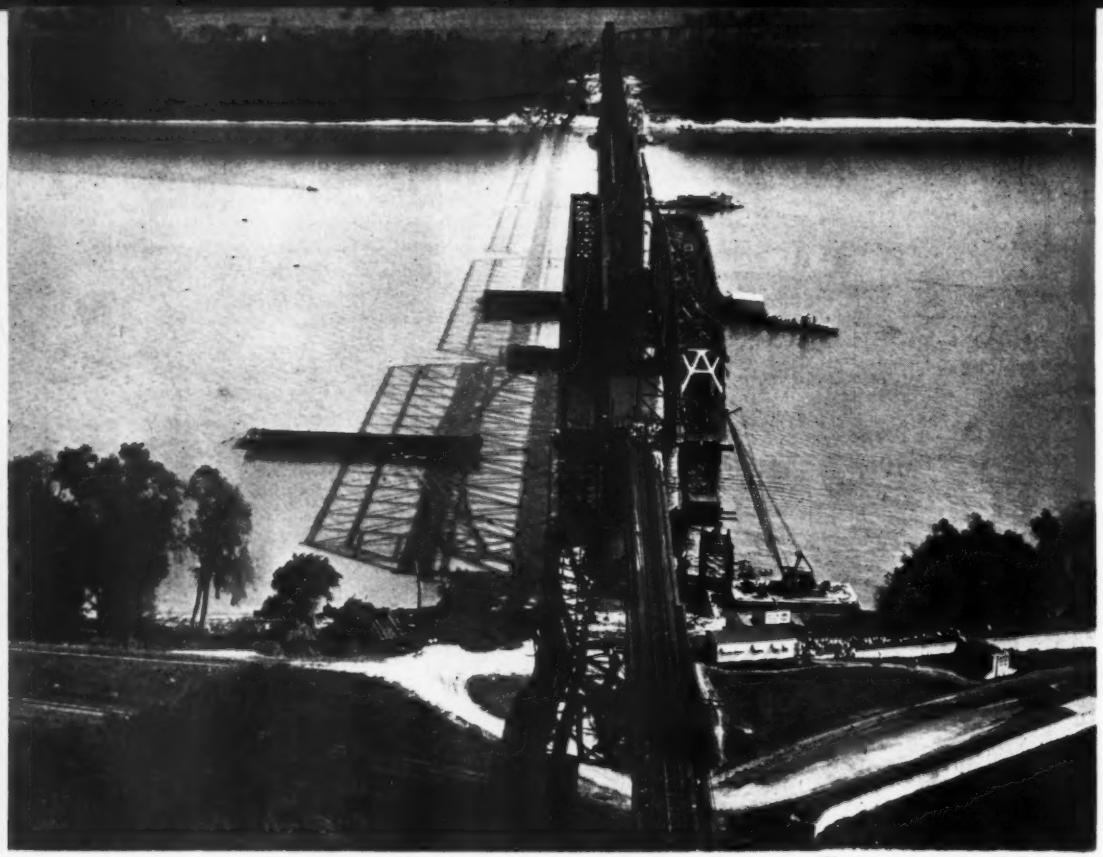


Photo courtesy American Bridge Company

The Illinois Central's Cairo bridge over the Ohio river, showing the first 518-ft. old through-truss span rolled onto falsework at the left to make room for the new, stronger span setting on another falsework structure at right

Cairo Bridge Getting

The most important bridge structure on the Illinois Central is being modernized at a cost of $6.3 million. A description of how nine Whipple through-truss spans are being replaced by six Warren through-truss and six deck-truss spans is discussed in this article. When completed, this structure will be able to carry any unit of motive power owned by the road.

• To the "sidewalk superintendents" standing on the north bank of the Ohio river at Cairo, Ill., on November 8, 1950, the splash made by a 518-ft. bridge span dropping 100 ft. into the river must have seemed the climax of one phase of a $6.3 million bridge-modernization project being undertaken by the Illinois Central at that point. Actually, this spectacular operation was an anticlimax to other work operations carried out several weeks earlier, when the old span was nudged to one side to be replaced by a new and heavier span.

Construction of the original Cairo bridge was started in 1887 and the structure was opened to traffic in 1889, at which time it was considered the world's longest metal railway bridge crossing a river, and one of the first all-steel bridges erected. Its design was more than adequate to carry the heaviest locomotives of that period when an engine weighed only 63 tons and its tender 40 tons. Today, however, the railroad's heaviest engines weigh 212 tons and the tenders 185 tons—too heavy for this structure—so the bridge was restricted only to lighter motive power at relatively low speeds. Because of the age of the structure and its continuing deterioration that resulted from the pounding of heavy traffic, maintenance was excessive and the renewal of the main channel spans became necessary.

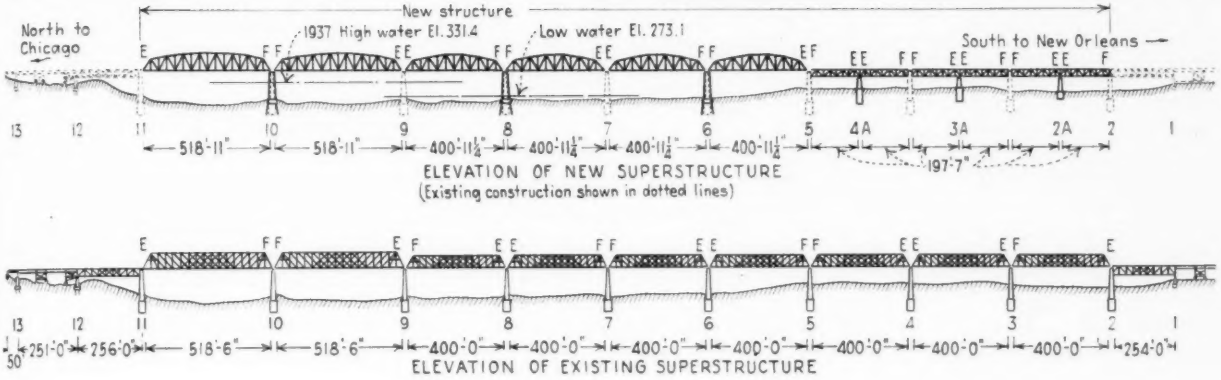
Trusses Are Weakest Link

When first built, the Cairo bridge was 10,560 ft. long. In 1905 and 1906, the north and south approaches to the bridge were double-tracked and several of the north approach spans were removed and replaced with a double-track embankment. As a result of this work, the bridge was shortened to its present length of 7,865 ft. The bridge was strengthened for heavier traffic loads in 1914 and the approach spans were rebuilt in 1934. Following the latter work the strength of the through-truss spans became the limiting factor. From north to south, the bridge now consists of one 50-ft. deck-girder span, a 251-ft. viaduct, a 250-ft. Pratt deck-truss span, two 518-ft. Whipple through-truss spans, seven 400-ft. Whipple through-truss spans, a 250-ft. Pratt deck-truss span, and a viaduct 3,170 ft. long.

The through-truss spans were originally designed for a moving load of 3,000 lb. per lin. ft. At that early date, no consideration had been given to the effect of impact caused by moving loads, so no direct allowance for the impact factor was included in the computations. However, the conventional use of low unit stresses in bridge design of that period enabled the continuous use of the Cairo bridge even with the operation of heavier

Left—Two of the deck-truss spans, which later will be used in the permanent superstructure, are being used as falsework during the erection of each through-truss span. Erected on barges, and lengthened by an end bracket, they are floated to temporary piers built on downstream side of existing structure

Below—Since the nine Whipple through-truss spans of the Cairo bridge are old and require excessive maintenance, they are being replaced with six Warren through-truss and six deck-truss spans



More Muscle

locomotives, although such power had to be operated over it at restricted speeds.

The plan adopted for the replacement of the nine through-truss spans calls for the erection of two 518-ft. 11-in. and four 400-ft. 11¼-in. through-truss spans over the main channel of the Ohio river, and the substitution of six 197-ft. 7-in. deck-truss spans for the three existing through-truss spans over the Kentucky shore, necessitating the construction of three additional piers and the remodeling of four existing piers.

Details of New Spans

All of the new truss spans will be of the Warren type. The floors are of open construction with steel stringers placed 7 ft. center to center, or 1 ft. outside of each rail. Panel lengths of 25 ft. for the shorter deck spans and approximately 33 ft. for the longer through-truss spans are being used. Because of the limited space on the existing piers, which are to be reused, the truss centers are the same as for the present bridge, i.e., 25 ft. for the 518-ft. spans, and 22 ft. for the 400-ft. spans. Truss centers on the deck-truss spans will be 16 ft.

Silicon steel is being used in the longer trusses where found to be economical. The shorter deck-truss spans and all of the floor systems are being fabricated from carbon steel. In members subject to deterioration from brine drippings, such as the top flanges of stringers and floor beams and the bracing, copper-bearing steel is being used. The expansion rollers for the spans are being made of stainless steel.

The existing piers, with the exception of two that had been girded with steel bands and turnbuckles and one that had developed cracks, are in good condition. It was decided to rehabilitate these three. This was accomplished in each instance by driving 12-in. steel H-piles, 56 ft. long, around the caisson to serve as support for a reinforced concrete jacket which was doweled to the pier shaft. To avoid interference with rail traffic, barges were used for the driving of the piles, the construction of cofferdams, and the hauling and depositing of all concrete materials. The concrete materials were transported to the site in 3-cu. yd. capacity truck mixers from a ready-mixed plant located in Cairo and transferred to 1-cu. yd. buckets on barges. They were then lifted and deposited into the forms by means of a crawler crane, equipped with a long boom, working from another barge.

One of the most unusual and interesting aspects of this project is the manner of erecting the new through-truss spans. It was decided to erect the new spans on falsework built on the downstream side of the existing bridge, roll the old spans to one side on other falsework built on the upstream side, and roll the new spans into their final position. The old spans would then be stripped of rails, ties, and parts of the floor systems, launched into the river and later cut up and salvaged as scrap. It was also decided to use two of the new short deck-truss spans, later to be used in the permanent bridge, as falsework for the erection, successively, of all of the through-truss spans. The plan for doing this called for erecting the two deck spans separately on barges, and floating them into position onto temporary piers constructed for that purpose.

The work was lined up to prog-

ress from north to south. With this arrangement the 518-ft. through-truss spans would be changed out first, and the two deck spans would be placed last after having served as falsework spans. Two standard coal barges, 26 ft. wide by 175 ft. long and capable of carrying 1,000 tons, were lashed to each other approximately 74 ft. apart, center to center, for the erection of towers for supporting the deck-truss falsework spans. These spans, being only 197 ft. 7 in. long, were too short to reach from the existing piers to a temporary falsework pier constructed midway between them. To meet this condition, a bracket of steel members was added to each of the deck trusses, and the spans were reinforced as necessary. These end brackets will be removed when the trusses are used for the erection of the 400-ft. through-truss spans.

Towers Are Adjustable

Perhaps the most unusual feature of this project is the design of the towers on the barges for the support of the falsework spans. These towers not only had to support the falsework spans during their erection but also while they were being transported from one span opening to another as the work progressed. Since the construction of the permanent spans would extend over a period of more than a year, another consideration —that of the rise and fall of the river level—had to be met. Government records showed that the Ohio river at Cairo had varied from an extreme high-water level of Elev. 331.4 (mean sea level) in 1937 to a low of Elev. 273.1—a variation of 58 ft. The records further revealed that the level frequently varies 17 ft. in one week and as much as 3 in. in an hour. Obviously, if the barge towers were to serve satisfactorily, they had to be adjustable within a range of at least 47 ft., which was the normal annual river-level fluctuation.

Each barge tower was constructed with four diagonally-braced corner columns. The columns are comprised of several sections so that they can be removed or added to conform to the variations in the river level. Each column also is supported on a 500-ton hydraulic jack so that the falsework spans can be raised from or lowered onto their pier anchorages.

The temporary center pier for changing out the first 518-ft. span consisted of two steel cage sections supported by steel H-piles up to 120-ft. long. The bent on the pier will support the midpoint of the new through-truss span during its erection

The temporary falsework piers will be constructed of steel members resting on a steel pile. The temporary pier to be constructed at the midpoint of each span will be built in two sections and tied together. Each of these sections is comprised of four 14-in. corner H-piles, with lengths up to 120 ft., between which a steel cage, previously constructed on a barge, will be hung. Other H-piles will be driven around the cage and fastened to it for additional bearing. A bent will then be erected above this pier to a height even with the top of the falsework spans.

The temporary end piers will be so constructed as to spread the load equally between the existing piers and the temporary construction. Twelve H-piles will be driven on the downstream end of each of the existing piers, and then capped and tied together laterally and diagonally. Above this a bent will be constructed which will be supported at one end by posts resting on a grillage placed on the caps of the temporary pier and at the other end by the starling of the existing pier.

The construction required on the opposite side of the bridge for the temporary support of the old spans before they are "dunked" into the river will be comprised of temporary end piers somewhat similar, but lighter in construction, to those built to carry the falsework for the new spans. On top of each of these end piers a launching apparatus will be constructed consisting of inclined ways to which the member directly suporting the old span will be held by a trigger device. The trigger devices of both piers for a particular span will be tied together by a steel cable. To launch the span the cable will be cut near the center of the structure, simultaneously releasing the triggers and allowing the span to slide down the ways and drop into the river, much like the launching of a ship.

Procedure Followed

The following description deals with the procedure followed in changing out the first of the two 518-ft. spans. The operation of rolling out the old span and rolling in the new one was carried out on October 16, 1950. As already indicated the old span was launched into the river on November 8. Because the work was delayed due to high water it was not expected that the second long span would be changed out until late in January 1951, with the old span being launched in February.

Old spans are temporarily supported on piers with launching ways held in place by trigger devices. Triggers of both piers are released at same time by burning a cable connecting them

A spectacular view of an old 518-ft. Whipple through-truss span dropping into the river with a tremendous splash. It was later cut up by divers and wreckers and salvaged as scrap

After both of the deck-truss falsework spans had been erected and floated into place, a temporary bracket platform was built at the shore end to receive a locomotive crane which was to do the erection work. The erection proceeded by laying the new floorbeams, stringers, lower chords and floor system for the entire length of the span, after which the crane erected the remainder of the new span. The center panels of both top chords were left "open" and the new span was then jacked up and placed on rollers at its midpoint and both ends.

With the new span thus ready for its lateral movement the bridge was closed to rail traffic and the old span was set on rollers. Two powerful, Diesel-operated winches, installed on a barge anchored upstream in the river, pulled on steel cables to move the old 518-ft. span onto its falsework. Two concrete sea anchors held the barge stationary. Each of these anchors was so contrived that under a cable pull it bit more firmly into the river bottom and could resist a pull of at least 30 tons. The rigging for pulling the old span to one side was made up of cable lines reaved through several blocks and falls so that a reave-line pull of only 9,000-10,000 lb. was exerted by each winch. The operation of moving out the first old span was accomplished in about 55 min.

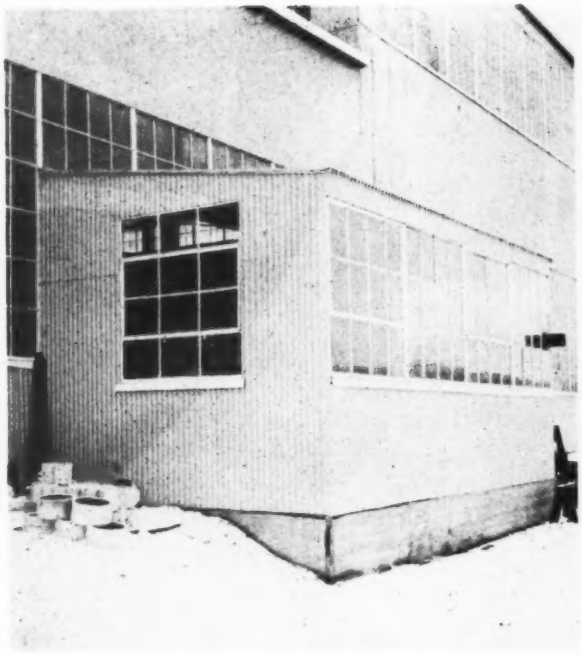
The lines were then fastened to the new span at its midpoint and ends for moving it about 34 ft. laterally. Within 15 min. it had been moved about one-third of the distance, at which point movement was stopped and the rigging was adjusted. When the new span had been moved one-half of its lateral travel, the rollers at the center of the span were removed, and the span was "swung" with all of its load now transmitted to the end piers and with only a fraction of the total weight being carried by the temporary end piers. The top chord joints were then fully bolted and the span was then moved the remainder of the distance to the final position.

Spans Moved in 8 Hr.

The entire operation of moving both the old and the new spans was accomplished in 8 hr. Four-way telephone communication was maintained between each end and the center of the span and the barge in the river to keep an accurate check for uniform movement. In changing out the first span, the bridge was out of service a total of 20 hr., although it had been anticipated that 48 hr. would be required. During the time that the bridge was out of service, trains were detoured via Metropolis, Ill., where they crossed the Ohio river on another bridge.

The procedure developed for changing out the first span will be followed in much the same manner in changing out the remaining spans. When the deck-truss spans are installed, two must be set in at one time to replace the longer old spans. Work on the three new piers required for the deck-truss spans had been completed and the cutting of recesses in the existing piers where the lower chords of the deck-truss spans will rest is well underway.

Design details were prepared and construction is being supervised by Modjeski and Masters, consulting engineers, in conjunction with the offices of C. H. Mottien, vice-president and chief engineer, and M. Block, engineer of bridges of the I. C. The substructure work is being done by the Kansas City Bridge Company and the Massman Construction Company both of Kansas City, Mo. The fabrication and the erection of the superstructure, as well as the changing out of the spans, are being performed by the American Bridge Company, Chicago.

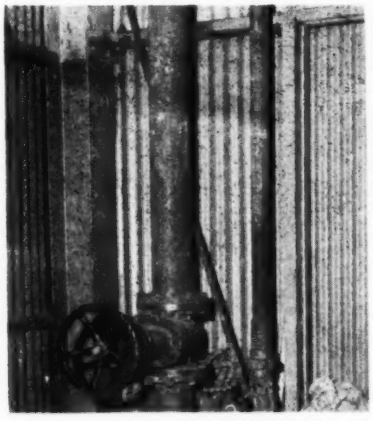


This leanto consists of corrugated-iron sheets riveted to . . .

. . . a prefabricated, welded framework of locomotive boiler flues

Locomotive Boiler Flues Get High Utility Rating

By salvaging boiler flues from the steam locomotives replaced by Diesels, the Toledo, Peoria & Western accumulated a large supply of high quality steel piping which it is now putting to many different uses



Boiler flues in service as steam pipes

• When converting from steam to Diesel operation, the Toledo, Peoria & Western, instead of scrapping its steam locomotives in toto, salvaged all the boiler flues in each unit. The idea was that a supply of relatively light, rigid and easily weldable steel pipe on hand might prove very useful, particularly in the event of a steel shortage.

That the idea was sound is attested by the many interesting applications which the road has found for the flues, some of which are pictured on these pages. From these boiler flues the road has made the frames of two small buildings, supports for shelving in a storehouse, bumpers at parking lots, bank-protection fences, roof gutters, railings, ladders and gates. It has also used the boiler flues as piping in water, steam, air and fuel-oil distribution systems. In fact, the piping for all Diesel fuel-oil installations on the road consists of boiler flues.

In all these applications a total of nearly two miles of the tubing, in diameters from 2 in. to 5 in., has been used to date, instead of critical materials. "The railroad industry has the same responsibility as any other industry to ease the pressure on the manufacturers of steel during the present emergency," according to J. J. Dailey, superintendent of motive power of the T. P. & W. "We must cooperate in helping to solve the problems of this basic industry so that they may supply the needs for national defense. An interesting sidelight on this program of cooperation is the fact that we are learning new uses for new steel pipe which would otherwise not have been attempted."

One of the flue-framed buildings mentioned above is a leanto, 12 ft. by 24 ft. in plan, projecting from one side of a machine shop. The other, somewhat smaller, houses sand-drying equipment. In constructing these buildings, the frames, consisting of 2-in. tubing, were first prefabricated by welding, next placed on concrete footings, and then covered with corrugated iron. The corrugated sheets were fastened to the frames by special rivets inserted in holes

Boiler flues form the supports for shelving in a storehouse

This roof gutter consists of 5-in. flues sawed lengthwise

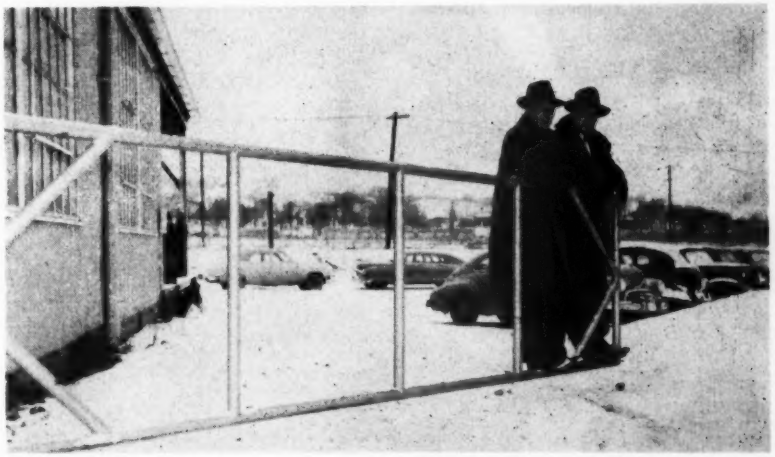
Five-inch boiler flues form a sturdy bumper at this parking lot

This railing around an office building is made of 2-in. flues

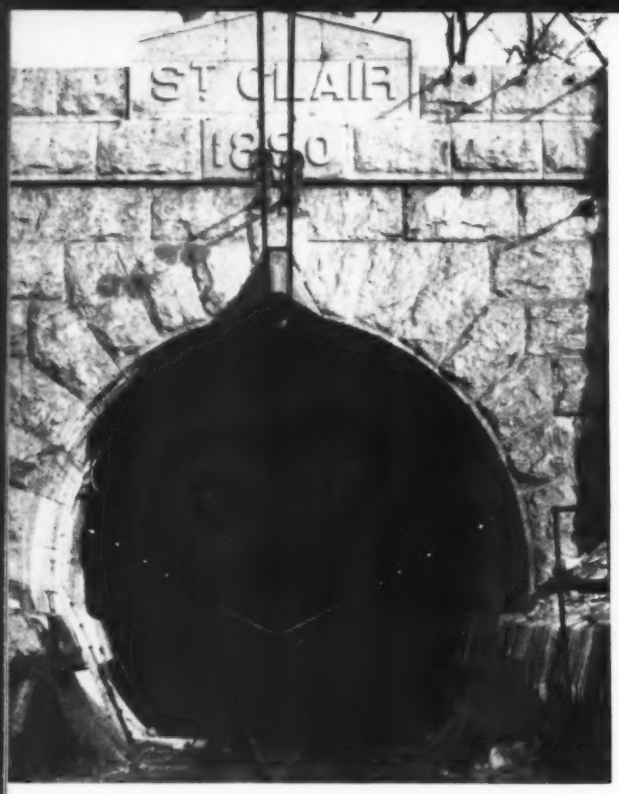
drilled through the sheets and pipes. These rivets are each split at one end and at the other end are equipped with a pin which projects slightly above the rivet head. After the rivet is placed in a hole, the pin is struck by a hammer, thus driving the pin into the rivet shank and causing the split end to spread and hold the rivet firmly in the hole.

Another application for boiler flues which the road now has under consideration is in the fabrication of roof trusses.

The various applications for boiler flues described in this article were developed by Mr. Dailey in collaboration with H. H. Main, chief engineer, and R. H. Egbert, assistant chief engineer.



Shown here demonstrating the sturdiness of a boiler-flue gate are R. H. Egbert (left), assistant chief engineer, and J. J. Dailey, superintendent of motive power



Shape and construction of St. Clair tunnel bore may be appreciated by this view of the American portal

SPECIAL TRACK DESIGN
Gives Needed Clearance In St. Clair Tunnel

The Canadian National has for many years been detouring high box cars and open cars with high loads around its St. Clair tunnel under the St. Clair river between Sarnia, Ont., and Port Huron, Mich. The detouring of these cars became necessary because the original track structure was such as to limit the vertical clearance to 16.33 ft. above the top of rail. This clearance was further reduced to 15.33 ft. by overhead trolley wires installed for a traction system. How the road was able to gain 6 in. additional clearance and thus end the detour is told herein.

• Through the use of a type of track construction including a continuous concrete stringer under each rail, carrying an arrangement of continuous steel plates and malleable iron chairs for supporting the rails, the Canadian National was able to obtain additional clearance in its important St. Clair tunnel, immediately west of Sarnia, Ont. This tunnel connects the Canadian National with its American subsidiary, the Grand Trunk Western. The tunnel passes beneath the St. Clair river between Sarnia and Port Huron, Mich. It is of great importance to the C. N. R. because it permits direct movement of traffic between Chicago and eastern Canada.

The clearance difficulties were due to the fact that in the construction of the tunnel the vertical clearance was restricted to 16.33 ft. This was later reduced to 15.33 ft., when an overhead electric traction system was installed. Thus, as the height of box cars began to increase, a point was eventually reached where all cars of a height greater than 15 ft. above the top of rail had to be detoured around the tunnel.

When eastward trains of the Grand Trunk passed through the yards at Battle Creek, Mich., the high cars were cut out and placed in trains for Detroit, where they were ferried across the Detroit river to Windsor, Ont. Detouring of westbound cars began at the yards in London, Ont., and was conducted in the same manner to Battle Creek. The cost of the detour operation is estimated as amounting to $15 per car. The number of cars so handled in a year's time represented a substantial part of the operating expenses of the two districts involved. Further, a delay of at least a halfday per car resulted from the rerouting, and for this reason it is possible that many shippers assigned their excess-dimension cars to other roads, resulting in a direct loss of revenue to the C. N. R.

The St. Clair tunnel was built in 1889-1891. It is a single-track,

Showing the forms and reinforcing in place for the new concrete stringers. The old timber stringers were shifted so that the new ones could be properly positioned

Placing chairs and plates on stringers preparatory to drilling the cinch rod holes

shield-driven bore, constructed of a number of flanged segments of cast iron. These segments are bolted together to form rings 1 ft. 6¼ in. wide and with inside and outside diameters of 19 ft. 10 in. and 21 ft., respectively. The rings, in turn, are bolted together circumferentially to form the tunnel proper which is 6,028 ft. long. Of this length, 2,699 ft. are in the United States and the remainder, 3,359 ft., is in Canada.

The approaches to each end of the tunnel are on descending grades of 2 per cent, which continue for 2,428 ft. into the tunnel on the American side and for 1,900 ft. on the Canadian side. For a distance of about 1,700 ft. in the mid-section of the tunnel the grade is practically level.

When the tunnel was built, its bottom was filled with concrete, brick and mortar to depths varying between 8 in. and 20 in., to form the foundation for the track structure. Four rows of continuous timber stringers were then laid directly on the concrete, and crossties were laid over the stringers, being secured with drift bolts. The rails, supported on tie plates, were secured to the crossties.

Maintenance Difficulties

This arrangement left no room for adjustment and after the electrification, in 1908-09, the clearance was fixed at 15.33 ft. While this figure may have been acceptable at that time, the continued growth of box cars and the retirement of older cars gradually led to the serious condition which resulted in the project to get increased clearance.

In addition to the clearance problem, the work of maintaining the track has been difficult in some respects. For example, the wood stringers and the concrete suffered heavily from mechanical wear and the use of shims was resorted to at many points. Anchorage of the rails was also a problem because of the sharp descending grades at each end of the tunnel.

A review of the problem indicated that the most practical way

Concrete for the new stringers was mixed at the American end of the tunnel and hauled in special hoppers mounted on trailers to the point of use

A section of track in the tunnel showing new stringers before the plates or chairs had been applied

Above—View of a section of track after work was completed except for placing the guard angles. Below—The character and arrangement of the rail-holding clips, and other elements of the special track construction, are seen in this close-up view

to increase the clearance would be to remove the existing tie-and-stringer construction and replace it with a new type of structure, involving only two stringers, these to be of concrete anchored to the old concrete foundation. The plan also called for continuous steel cover plates, anchored to the concrete stringers and supporting malleable iron chairs for holding the track rails in proper position. In this way the clearance could be increased 6 in.

Daily Occupancy—2½ Hr.

The initial phase of the project—that of preparing the foundation—was begun in the early fall of 1948. Because of heavy traffic in the tunnel, it was necessary to set up definite arrangements for the construction forces to have the use of the track. This resulted in a daily period of track occupancy, beginning at 1:30 p.m. and ending at 4:00 p.m.—2½ hr. On a few occasions, this was extended until as late as 5:00 p.m.

This 2½-hr. period made it necessary to plan each day's work with care to assure that steady progress was made. In many cases, where the track was not obstructed, work could be progressed outside of the track-occupancy period, using flag protection as a warning system.

In the first phase of the project, which involved the preparation for the concrete stringers, all of the old track was removed and the old wooden stringers were shifted to clear the location for the new concrete members. The old concrete foundation was inspected and all defective material was removed and the ties and rails were replaced. Forms for the new stringers, and steel reinforcing, were placed in position under traffic. The final step, before concreting, was to wash the surface of the old concrete within the forms until clean, after which it was sprinkled with Ferritex powder, a material produced by Truscon Laboratories, which is designed to improve the bond between the old and new concrete.

Concrete for the stringers was poured in the track-occupancy period between 1:30 p.m. and 4 p.m. Mixing was done outside the west end of the tunnel and was hauled to the point of use in special hoppers mounted on two ordinary trailer cars, which were pulled by motor cars. To avoid

violating a safety rule concerning the pushing of trailer cars by a motor car, two motor cars were coupled to the trailers—one at each end. Thus, the concrete "train" could be pulled in each direction.

Building the concrete stringers began on November 17, 1948, and was completed on October 7, 1949. The next step was to lower the track on to the continuous steel plates and rail chairs on the stringers. The continuous plates were 20 ft. 3 in. long, 15 in. wide and 5/8 in. thick. The plates were shop drilled with two rows of 1 3/16-in. holes 9 in. apart; these holes had a longitudinal spacing of 1 ft. 6 9/16 in. They were for the bedplate hold-down bolts. In addition, 1 1/32-in. holes with a 3 in. stagger were drilled and countersunk from the bottom of the plates on the same gage line as the hold-down holes, but located midway between them.

Before the bed plates left the shop, the 1 1/32-in. holes were filled with 1-in. threaded bolts, 5⅛ in. long, which were inserted from the bottom of the plates and welded in place. The purpose of these bolts is to hold the rail chairs in place as will be shown later.

When installing the plates, short sections of the old track were removed. At first the plates were carefully placed in exact position on the stringers while the positions of the 1 3/16-in. holes were marked on the stringers. The plates were then removed and air tools were used to drill 1¾-in. holes into the concrete stringers and into the old concrete, the depth of each hole being 11½ in. As the work progressed it was found that it was simpler to drill the concrete with the plates in place. Plain cinch anchors, 1 in. in diameter were then placed on ⅞-in. by 14-in. bolts and screwed snug to the bolt head, after which the bolts were placed heads down in the holes.

Fabco Pads Used

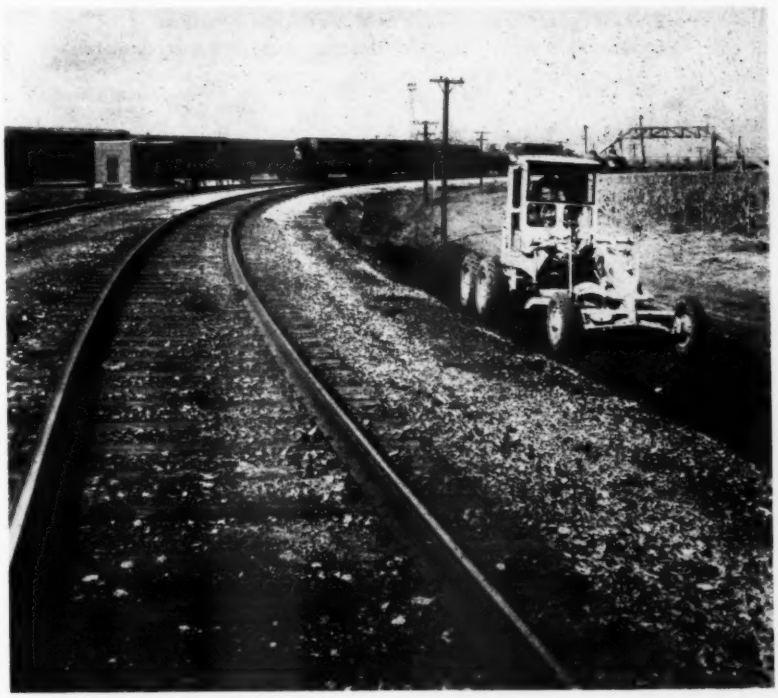
The next step was to apply the rail chairs. Before this was done, however, cushions consisting of Fabco pads, 6¾ in. by 13 in. by ⅜ in., were placed over the short bolts projecting above the bed plate. These pads are a mixture of cotton duck and rubber—actually the "trim" from the manufacture of Fabreeka pads. Their purpose in the tunnel is to serve as a resilient cushion beneath the chairs, thus reducing vibration and cutting down the noise and vibration of train movements. The chairs, which are placed on top of the pads, resemble a tie plate except for a much thicker base and are 6½ in. by 12 in. in plan. The base is 1¼ in. thick at the outer edge but only 31/32 in. thick at the inner edge, thus imparting a cant of 1 in 20 to the rail. The chairs were designed for use with 100-lb. rail.

Each chair is drilled with four holes, one near each corner. Two of the holes—in opposite corners of the chair are slotted 1⅛ in. by 2 in. and are for the chair-holding bolts. The other two are for ⅞-in. by 3½-in. bolts which were inserted from the bottom of the chairs before installation and which serve to hold a rail clip in place on each side of the rail at every chair. After the rails were lined and gaged, the chairs were bolted securely to the plates.

The installation work was carried out in increments of 160 track-feet. The first step in the work on each increment was to install the plates, complete with chairs, on both stringers with ½ of the hold-down bolts applied. The next step was to install the corresponding amount of new rail on the chairs. The remaining bolts were installed when time permitted. Hot lead was poured around each cinch bolt shortly after the rail was installed on the chairs, after which the plate-holding bolts were made tight. A prefabricated timber runoff, 36 ft. long, was used to overcome the difference in elevation at the end of each day's work.

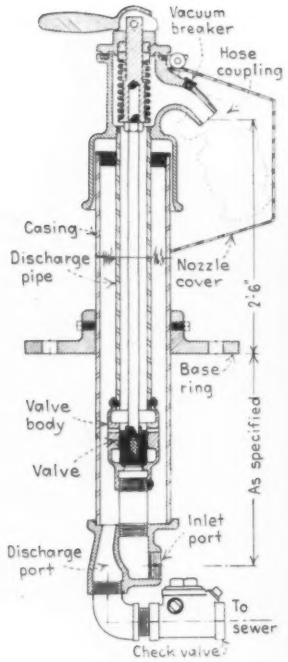
Among the power tools and equipment used on the project were two Ingersoll-Rand 105 c.f.m. and one 315 c.f.m. air compressors, a ½-cu. yd. steam-powered concrete mixer, four jack hammers, 4 concrete busters and a number of impact wrenches.

This project was planned and executed under the general direction of E. R. Logie, chief engineer of the Central Region of the C. N. R., Toronto, Ont., and J. W. Demcoe, engineer maintenance of way, Toronto. J. W. Salmon, who retired recently as engineer of bridges, exercised general supervision over the project, with E. T. Gove, division engineer at London, Ont., and F. W. Young, bridge and building master, in direct charge. The type of track construction used in the tunnel was developed by C. P. Disney, retired engineer of bridges of the Central Region, who holds Canadian and United States patents on the various elements of the design.



A CATERPILLAR DIESEL NO. 212 MOTOR GRADER making a cut 3 ft. deep by 18 ft. wide in the Davis yards of the Alton & Southern at East St. Louis, Ill.

Post Hydrants "Weather"



Above—Cut-away view of the non-freezing hydrant shown at the right supplying water to coaches of the N. P.'s North Coast Limited at Spokane, Wash.

Designing coach watering facilities that must be pollution-proof and operate consistently and effectively at extreme sub-zero temperatures is no easy task. However, collaboration between Northern Pacific engineers and the Railroad Products Company of Cincinnati, Ohio, has produced a post-type hydrant to fit these exacting requirements.

By H. M. SCHUDLICH
Engineer of Water Service
Northern Pacific

• The crane or overhead type of hydrant is recognized by most public health authorities as being the most reliable for furnishing sanatory water to railway coaches and other equipment. However, many of its great advantages are nullified by excessive maintenance during cold weather and by the impracticability of installing the cranes in most servicing areas because of clearance restrictions imposed by the necessary use of baggage, mail or service trucks in those areas.

Furthermore, coach-servicing facilities are frequently remote from steam-heat systems and the cost of furnishing steam and of maintaining a steam line for overhead hydrants installed at such locations would be a continual source of expense. Electric heating cables might solve the difficulties but, if not properly installed and maintained, could result in a hazard to both passengers and servicing employees. In any case, a power failure for several hours would result in complete failure of the watering system and could necessitate the replacement of all piping and valves, which would be very expensive. In view of such defections the continual expense of heating cable is unwarranted.

The capitalization of the cost of steam and electricty and the elimination of maintenance will usually justify an expenditure for the installation of a weep-hole drainage system, which is the greatest expense and most common deterrent to the installation of post-type hydrants. If the expense can be justified, post-type hydrants can in many cases be made to satisfy the normal requirements of such serving areas as mentioned above. Such hydrants have the advantage of being above hopper spray; they will not, as a rule, accumulate wind-blown debris; and, when properly installed, they will deliver water of a quality that will satisfy the minimum bacteriological standards.

These factors were given consideration when it became necessary to install some form of hydrant system at both Glendive, Mont., and Spokane, Wash. At each of these locations, the physical characteristics of the tracks and property, as well as normal weather conditions, indicated that post-type hydrants would be practicable. At both terminals, track centers were wide enough to permit the unimpeded use of platform trucks with post hydrants installed along the centerlines of the platforms. However, other factors, such as severity of winter weather, and subsurface soil conditions at each place were so different that identical drainage systems could not be installed.

After consideration had been given to these factors and to various styles of hydrants, a type known as the McGarry "Rapro"

40 Degrees Below Zero

No. 747,* shown diagramatically on the opposite page, was installed at both locations. This is a self-draining, non-freezing hydrant that is said to be pollution-proof. The operating parts are similar to other McGarry hydrants but the draining features differ. After this hydrant is shut off, the water in the discharge pipe drains into the casing, thence through a discharge port and drain check valve into whatever type of external drainage system is provided to suit existing conditions.

It is in this drainage system that the coach-watering facilities installed at Glendive and Spokane differ. The ground underlying the servicing area at Glendive is a water-saturated blue clay and, therefore, cannot be relied upon to absorb any of the drainage water. Hence, subsurface drainage is impracticable. To obtain rapid drainage of the hydrants installed under these conditions, a 3-in. Transite drainage system was installed and each weep hole connected to this line with a double-elbow flexible joint.

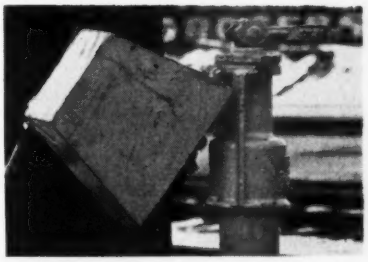
The line was accurately laid with a 7-ft. bury and a gradual slope from both ends of the platform to a point in front of the depot. To comply with public-health standards, the drainage lines at this point lead to a concrete sump 2 ft. by 3 ft. in plan and 5 ft. 6 in. deep, from which duplicate Fairbanks, Morse automatic sump pumps handle the drainage water through an air gap to a sanitary sewer laid along the basement ceiling. The basement installation prevents freezing and offers adequate protection to the sump pumps.

The 13 hydrants installed at Glendive in a 1200-ft. platform area are giving very satisfactory service and did not freeze at any time during a long period of severe cold weather in the winter of 1949 and 1950. The hydrants were installed near the platform light posts which offer a measure of protection from damage by platform trucks.

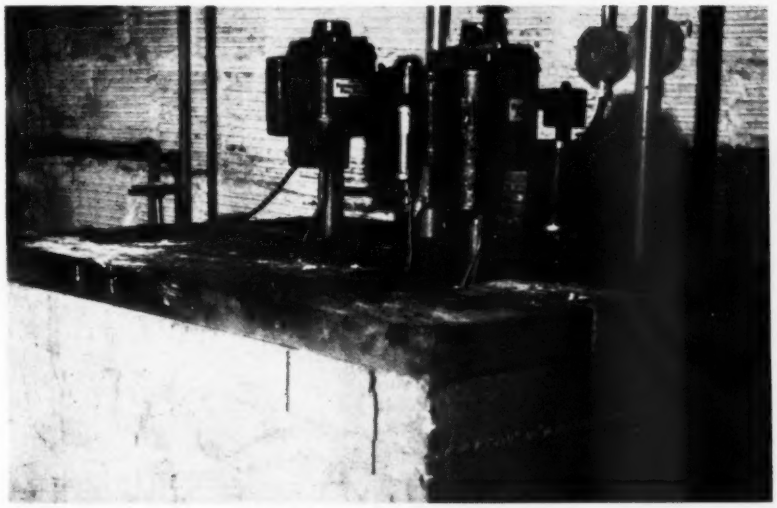
At Spokane the train servicing area is located on a high, pit-run gravel fill divided by two underpasses. It was decided that draining the hydrants into this gravel would give satisfactory service and would circumvent the necessity of sectionalizing, at the underpasses, any other type of drainage system that might be installed. Red-Head-drive well points, 1½ in. by 24 in., were driven into the gravel to a point slightly more than 10 ft. below the platform surface and the hydrant weep-hole drains connected to these well points. After the well points were installed, water was added under pressure to the drive pipe and a clean gravel pocket was thus developed by means of a surge block. These gravel pockets assist in rapidly draining the hydrants and thus prevent freezing or ice accumulation during severe cold weather. Guard posts to protect the hydrants from being damaged by platform trucks were installed at all locations except where it was convenient to install the hydrants near existing light poles. A total of 39 Rapro No. 747 hydrants were installed in this way and to date are giving satisfactory service.

*Manufactured by the Railroad Products Company, Dept. RE&M, Cincinnati 25, Ohio.

Cover is raised to couple hose and . . .



. . . closed to guard nozzle when not in use



At Glendive drainage water flows to concrete sump in station basement, from which two Fairbanks, Morse automatic sump pumps handle it through an air gap to sewer

"Plant Community Management" For Right-of-Way Brush Control

By **FRANK E. EGLER, Ph.D.**
Consulting Vegetationist
Aton Forest, Norfolk, Conn.

An approach to the problem of brush control on right of ways, differing somewhat from those now in use, has been evolved by Dr. Egler. His method usually involves, first, the spot killing of unwanted plants to produce a selected cover of low shrubs, coarse herbs or any other species desired, and, second, the low-cost maintenance of that stabilized community through succeeding years. This article presents for the first time the data on the total reinvasion of an experimental tract in Connecticut, nine years after initial conversion.

Left — A ground cover of hay scented fern produced by the spot killing of unwanted plants

Below—A ground cover of a variety of juniper. This shrub is lower than most grasses and does not constitute a fire hazard

• Conventional herbicidal brush-control practice on right of ways generally involves overall spraying with the intent of killing all woody trees and shrubs, and coarse broad-leaved herbs, thereby producing a grassland. In my opinion the killing of patches of ferns, coarse herbs and low shrubs is unnecessary, as such plants are completely permissible along the margins of many types of right of ways. In fact, I believe that such a shrub and coarse-herb community is not only permissible but actually more desirable than a grassland, for dense shrubs and herbs frequently retard the growth of existing tree seedlings, or actually kill them. Furthermore, land covered with low, dense, compact and soil-shading shrubs offers very limited opportunities for the establishment of invading tree seeds, compared with grassland, which is often open and bare soiled.

In recent years I introduced a new technique of brush control on right of ways based on 20 years of investigation at Norfolk, Conn., and elsewhere. As one aspect of Plant Community Management, this technique involves two distinct botanical procedures: (1) the con-

version of the existing plant cover into a stable plant community composed of those species which can be tolerated for the purpose; and (2) the **maintenance** of that community through succeeding years.

The conversion procedure involves the dual process of killing unwanted plants and protecting wanted plants. Unwanted plants include all tall trees, thorny shrubs and poisonous plants which spread by themselves, and which will not disappear of their own accord in the natural processes of vegetation development. The list of unwanted species will vary according to region, local site, and past history of the area. Often a species which is slated to be killed by herbicides in one area may be passed over in another, where it would disappear anyway by natural means.

Wanted plants include all those herbs and low shrubs which are not only permissible on the site, but are actually favorable in that they produce a dense, compact cover which resists invasion by trees. Thus the process of conversion is a selective affair, accomplished only by spot-killing, except, obviously, where there is a total cover of unwanted species. It is the problem of the botanist to encourage the particular species, out of the many available, which will produce the most stable community possible for the site.

Maintenance of the stable community on the right of way involves the spot killing and elimination of those invading trees which, if not killed, would spread rapidly and destroy the desired cover. Certain plants like black locust and tall sumach spread underground from some shoot already established. Others, as some pines, spread by seed. Some unwanted species should be watched for carefully and eliminated quickly. Others may be of no great concern for the community. The amount of maintenance that will be necessary for the right-of-way shrubland will be in direct ratio to the worth of the botanical knowledge applied in the original conversion, and eventually will depend upon the botanical knowledge that is applied in eliminating certain unwanted species which have invaded.

At Aton Forest, a 400-acre private research tract in northwestern Connecticut, 20 acres are being used for the study of types of shrubland which would be suitable for right of ways. These lands are mainly abandoned fields which had borne a brush cover up to 12 ft. in height. They include also previously forested roadsides, and some recently cut-over forested sites. Of 300 kinds of plants found on the tract, about 100 are of significance in being either desirable or undesirable for a right-of-way cover for this site and in this region. Only about 25 shrubs and coarse herbs are capable of forming dense, solid masses. These are of variable value from the standpoint of stability, tendency to extend their areas, and resistance to invasion by trees.

Grass and brush in these fields were last mowed in 1940. Since that time they have not been mowed, burned, grazed, or otherwise disturbed except for herbicidal conversion activities not yet completed. These conversion activities have included the killing of unwanted trees and shrubs that had been present prior to 1940. The present converted shrubland is composed predominantly of wild spiraeas, low willows, a viburnum, some blueberries, huckleberries, winter holly, fetterbush, azalea, mountain laurel, certain ferns, goldenrods, asters and milkweeds, several grasses, mosses and prostrate lycopods, and about 100 other "permissible species."

To determine the amount of reinvasion by unwanted species which had accumulated between 1941 and 1949, a typical 10-acre section of this shrubland was sampled on October 9, 1949. In this work 125 plots, each containing 100 sq. ft., were laid out in five arbitrarily chosen strips, each strip with 25 plots. Each plot was aribtrarily located by walking ahead for a definite distance from the plot previously studied. The area of the 125 sample plots was 12,500 sq. ft., or more than ¼ acre, and thus represented over 1 per cent of the total 20-acre tract.

For each plot, a complete list was made of all woody plants which had invaded since 1940,

A ground cover of brake. Although this plant dies to the ground each year, its canopy of foliage successfully inhibits the growth of young tree seedlings

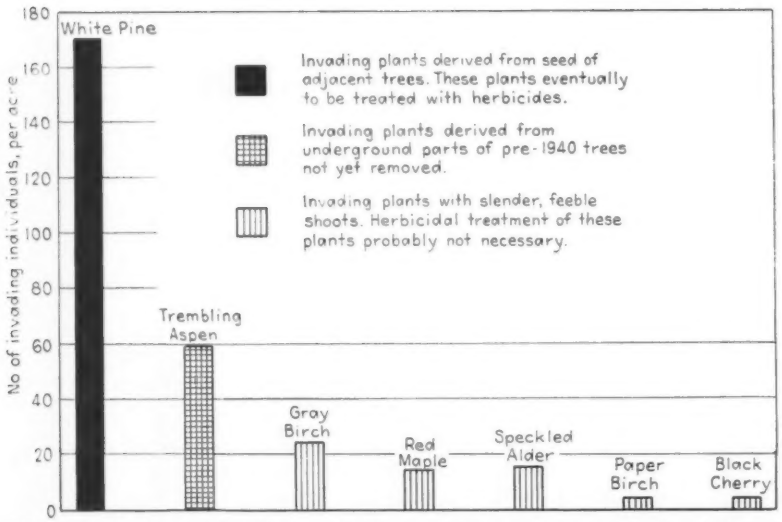


Chart showing the number of unwanted woody plants, on a per acre basis, which had invaded a typical 10-acre section of converted shrubland in Aton Forest since 1940

either as seedlings or as distinct new shoots. These data, converted to a per-acre basis, are presented in the accompanying chart and represent graphically the accumulated maintenance of this particular right of way shrubland, for a total of nine years.

These data are surprising in many respects, for they not only run counter to what many botanists had anticipated, but they also point the way to far lower maintenance costs than had been thought possible. There are 69 kinds of woody plants which are growing on or adjacent to this tract, producing fruits and seeds which might be assumed capable of spreading into and altering the shrubland. Of these 69, it is amazing that only seven undesirable species have appeared in the plots. Of these seven, however, as shown in the accompanying chart, the aspen shoots, without exception, appeared to be root-suckers from nearby older trees at local spots held for research purposes and not yet converted to shrubland, and thus there is reason to assume that they would not have been present had the area been uniformly converted.

Five of the seven species (alder, black cherry, red maple, paper birch and gray birch) occurred sparingly, and were all small slender plants. They did not appear robust, and there was a reasonable chance that they would be nipped off by deer or mice, if not shaded over and stunted by shrubs and heavy herbs. In any event, the individuals of these five species do not warrant herbicidal spraying at this time. White pine was the most abundant species, with 49 individuals up to three feet in height occurring in one-third of the plots. All pines appeared to be in good health and were destined to grow one to two feet per year, with occasional setbacks due to weevil damage of the leaders. We thus find that of 69 potential woody invaders of this shrubland, only one species, white pine, is to be reckoned with at this time as an aggressive undesired invader. Since this species, however, is not yet of a height undesirable for right-of-way cover, and since older pines can be killed as easily as smaller ones, with no increase in labor and little if any increase in chemicals used, it stands to reason that maintenance operations can be postponed for several years.

To sum up, this analysis of a typical northeastern 20-acre shrubland botanically designed for right-of-way purposes, shows that the total accumulated nine-year reinvasion by unwanted woody plants is so small that no maintenance operations at this time are warranted. Thus, it is reasonable to assume that, after the recommended conversion on a right of way is attained, no maintenance will be necessary for at least 10 years afterward. When maintenance does become necessary, (possibly in four or five years on the test section) its cost on a per-year per-acre basis will be very low.

A ground cover of low blueberry which requires no mowing and will resist invasion of trees and brush for several decades

A ground cover of a golden rod. This particular species forms a cover which is more stable than grass covers in the vicinity

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems

Patrolling Main Tracks

How often should main tracks be patrolled? By whom should the patrolling be done? How?

Inspect Every Two Days

By H. F. REILLY
Engineer Maintenance of Way, Lehigh Valley, Bethlehem, Pa.

The frequent testing of rails in track by detector cars and the ever increasing amount of control-cooled rail being installed in main tracks have resulted in the elimination of daily inspection of rails for defects. Under normal conditions, adequately maintained track does not require daily inspection. The use of heavy rail and track fastenings on well-ballasted and surfaced track, having adequate drainage, minimizes the possibility of any sudden development of dangerously rough spots in track. Rough spots should be detected by track supervisors or their assistants while riding trains over their respective territories on their weekly or semi-weekly trips, before such spots are readily noticeable by track foremen on the ground. Supplementing these riding inspections detail inspections should be made of all main-line switches about twice each week to assure perfect maintenance.

Main tracks on the Lehigh Valley are systematically patrolled by track inspection gangs of two men —a foreman and a helper—traveling by track cars over assigned territories in the middle of which they have their headquarters. These territories consist of 40 to 50 mi. of double track, or the equivalent if there are more or less than two tracks. These inspectors work five days each week and inspect their entire territories every two working days by inspecting east of their headquarters one day and west the next. Twice every week they make a careful, on-foot inspection of each main-line switch.

It is the duty of each track-inspection foreman to make close inspections, of all conditions on his territory, to keep the respective section foremen informed as to these conditions; to protect against any conditions affecting the safe operation of trains; to arrange for immediate correction of such conditions, and to submit to the track supervisor daily reports covering the territories inspected as well as any irregularities discovered.

When equipment failures, such as broken wheels, dragging brake rigging, etc., occur, special patrols are dispatched to look for possible track damage. Extra patrol protection is also provided at locations where washouts, landslides or falling rocks are likely to affect track conditions during unfavorable weather.

None of these track patrols relieve the track foremen and other supervisory employees of the responsibility of observing track conditions closely and detecting those warranting special attention.

Suit to Local Conditions

By CHARLES MILLER
Assistant Roadmaster, Western Pacific, Elko, Nev.

The frequency of track patrols depends, in order, on the weather and terrain, the type and amount of traffic and the general condition of the track structure. The weather and terrain are given precedence over track structure because most main-line tracks are usually maintained in such condition as to elim-

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the April Issue

1. Why do track motor cars sometimes derail at self-guarded frogs? What can be done to prevent these derailments? Explain. To what extent would motor-car wheels with treads conforming to "MCB" standards be practicable for this purpose?

2. What effect, if any, does the use of non-glare or heat-resisting glass in the windows of interlocking towers have on an operator's ability to differentiate between the various colors of signal lights? Why?

3. What are the most satisfactory methods of cleaning or removing foul ballast from long tunnels? Can such ballast be removed efficiently and economically by power-driven equipment? If so, how? Is the length of tunnel a factor? Explain.

4. In treated timber trestles, what are the advantages of caps made up of two pieces of timber 8 in. by 16 in. or 7 in. by 16 in., placed on edge and bolted together, as compared with the usual 14-in. by 14-in. solid caps?

5. What is the most economical method of cutting brush where its diameter near the ground is from one to two inches? What tools and equipment are needed? How many men should be used to progress the work rapidly?

6. Under what conditions are low-water alarms needed at out-of-the-way water stations? What methods of installation are most effective? Explain.

inate the necessity of frequent inspection. The terrain through which a track runs is in itself an important factor, but is more or less directly associated with weather conditions in determining their combined effect on the frequency of track patrols.

As a general rule in all territories, section foremen should be required to cover their entire sections personally twice each week. If conditions beyond his control prevent him from doing this, he must go over his section at least once that week, relegating the second trip to a reliable man. This semi-weekly inspection is to discover and remedy track conditions which might otherwise become unsafe, to fill switch lamps and to determine the precedence for future maintenance items of work. During these inspections any other conditions, either on or off the right-of-way, which may affect the company or its property should receive such attention as they require.

On desert or prairie sections of 10 mi. or more, I am in favor of assigning a permanent track inspector on a velocipede to cover the section regularly. It would be his duty to handle all items such as replacing bolts and maintaining insulated joints, repairing crossing gates and patching fences, cleaning culverts and protecting bridge approaches, filling switch lamps and making switch adjustments, as well as caring for roadway signs. If he should discover any condition too big for him to handle alone, he should report it to the foreman for correction. This scheme could be considered as a general rule, and weather, terrain, etc., as the conditions or circumstances which alter that rule. In rocky or curved territory, daily patrols are in order.

Rail on curves requires closer inspection because of added strain, and rock falls and slides may occur where they cannot be seen by enginemen in time to stop. A trackwalker or mobile inspector can usually discover such things in time to prevent derailments. In stormy weather, with the increased possibilities of rocks falling, slides, wash-in and wash-outs, 24-hr. patrols may be necessary. These should be carried out by section men, with the foreman remaining at, working near, a known spot so as to be readily available in case he is needed by any patrolman who may discover trouble. It is understood, of course, that the necessity of such around-the-clock patrols increases in direct ratio with the severity of the storm and the ruggedness of the terrain.

The foreman in any area undergoing an extremely cold spell should make a daily inspection of his entire section each morning as early as possible. This trip must be made by the foreman accompanied by sufficient men to handle any condition found. During inspection he will discover and can replace any bolts that may have broken during the night. To afford rapid and complete coverage of the section before open joints can result in train delay, a motor-car (or the method of transportation considered standard on that particular section) should be used.

Patrol Daily on Foot

By William Lindsey
Yard Foreman, Chicago & Illinois Midland, Pekin, Ill.

In this day of heavier freight loads and high-speed traffic, mainline tracks should be patrolled daily—yes, seven days a week. The patrolling should be the responsibility of each section and should be done by a reliable member of the track forces on foot—except where sections are extremely long. In such cases there is no alternative but to use a motor car. Only on foot can track be inspected thoroughly and the small things be observed that patrolling by motor car or other means will miss.

A foreman can also help his cause along by personally patrolling his section from time to time. By getting out in the field he can see for himself and correct faults that will help to lessen the patrolling duties of his patrolman or trackwalker.

While patrolling track, a trackwalker should be equipped with spare bolts, a lightweight track wrench, a spike maul, a red flag, fusees and torpedoes. The spare bolts, flag, fusees and torpedoes can be carried in a canvas bag like a newsboy's "paper" bag, only made on a smaller scale. Thus equipped, with his load cut to a minimum, he is ready for any trouble he may find.

Types of Gasoline for Work Equipment

What types of gasoline are best suited for use with work equipment? Explain. Should high-octane or low-octane fuels be used, or can they be used interchangeably? Why? How can it be assured that the correct "gas" is regularly obtained from dealers?

Engine Condition a Factor

By J. M. Miller
Automotive Division, Sales Technical Service, Standard Oil Company of Indiana, Chicago

Throughout the United States, two types of gasolines—premium and regular—are generally sold by petroleum marketers. These gasolines are designed for use in all types of carburetor engines, particularly passenger cars and trucks which are the principal gasoline users. The essential qualities of today's gasoline are: uniformity, satisfactory anti-knock value, economy, easy starting in cold weather, rapid warm-up in cool or cold weather, good acceleration, clean burning, and seasonally adjusted volatility to give freedom from vapor lock, yet permit suitable starting commensurate with seasonal temperatures.

The only other significant difference noticeable to commercial and private operators between premium and regular gasolines is their anti-knock value designated by an octane number. Premium-grade gasolines perform a valuable service for engine operators whose engines knock because of their design, or mechanical or operating considerations. When fuel combustion proceeds normally without knocking, there is no knock remaining that the fuel can suppress. In other words—there is nothing to be gained from controlling something already under control.

Because of the singular importance of gasoline octane value, let us first consider the octane requirements of engines. Surveys have been made of the fuel anti-knock requirements of cars and trucks in all states of repair or adjustment. The difference between commercial-vehicle octane requirements and passenger-engine octane requirements is surprisingly small. For instance the average regular gasoline will satisfy the engines of

60 to 70 per cent of all passenger cars and 60 to 65 per cent of the engines of all commercial vehicles. The average premium gasoline will satisfy the engines of 90 to 100 per cent of all passenger cars and 95 to 100 per cent of all commercial vehicles.

This illustrates in part why the individual operator must make a choice. This becomes even more evident when the influence of mechanical adjustment and operating conditions on engine anti-knock requirement is included. Let us consider briefly the influence some factors have on an engine's knock requirement.

The engine octane requirement increases approximately one unit for each 10 deg. F. rise in air temperature. High localized temperatures in individual cylinders, in contrast to engines as a whole, increase knocking tendencies appreciably. Carburetor hot-spot temperatures do not follow this temperature pattern, there being an actual reduction in octane number of approximately three units when the intake manifold hot-spot temperature is raised from 90 to 260 deg. F.

Ignition timing greatly influences the tendency to knock. An increase of four degrees in spark advance in the workable advance range increases the octane requirement on the average of six units. Timing deviations between engines in use vs. manufacturers' settings show variations in octane requirements of as much as 15 units. Lack of precision timing is largely responsible for the peculiar situation where one engine will not knock with regular gasoline while its twin in the same service will knock even with a premium gasoline.

Combustion-chamber deposits increase the tendency to knock. Removal of combustion chamber deposits reduces the octane requirement of engines as much as 28.5 numbers. The average decrease is approximately 10 octane numbers. It is interesting to note that the same weight of combustion chamber deposits in light "stop-and-go" service increases the octane rating to a much greater extent than when the same engine is in heavy-duty over-the-road service.

The octane number of the average engine decreases approximately three units for each 1,000 ft. increase in altitude. The lower the moisture content of the air, the greater is the tendency to knock. When the relatively humidity is decreased from 90 to 20 per cent at 70 deg. F., the octane requirement of test engines increases about 4 units. Also the leaner the mixture the greater the tendency to knock.

Considerations such as the above must be given attention when a fuel is selected. Even then, the type of operation can greatly influence the maintenance needed. In engines under steady load and constant speed, combustion-chamber deposits increase at a more rapid rate, and such engines require more mechanical attention than the same engines in truck and passenger-car service operating under variable load and speed conditions. It is reasoned that constant-speed, constant-load operation does not enable engines to purge deposits as readily as do variations in operation.

Cooling-water temperature influences wear, lubricating oil dilution, and deposit formation to a great extent. Using the same fuel and lubricant, engines operating in cold weather under stop-and-go conditions without thermostats, show approximately ten times the wear of engines whose coolant is held above 160 deg. F. Dilution of lubricating oil by unburned fuel and contamination by water become serious when cooling water temperature are below 130 deg. F. Such unburned fuel and water contribute materially to the sludge problem, necessitating, in some cases, early engine overhaul.

The efficiency at which any internal combustion engine is operated is dependent upon three closely related things—fuel, lubricant, and operating conditions. Many petroleum companies have well-trained personnel to consult with operators on methods whereby they can best utilize both their equipment and the fuel and lubricant they use. By consulting these reputable suppliers, the most economical fuel and lubricant combination for a particular service can be secured.

Lead Harms 2-Cycle Engines

By Technical Service Manager

The best type of gasoline to use on most work equipment powered with four cycle engines is regular grade gasoline. Premium grade gasoline, which has a higher octane rating than regular grade gasoline, should only be used where the octane requirement of the equipment in question cannot be satisfied with regular grade gasoline. In other words, if the work equipment does not knock with regular grade gasoline, there is nothing to be gained from an operating standpoint by using premium grade gasoline which, of course, costs more per gallon.

Premium and regular grade gasolines can be used interchangeably, provided an appreciable amount of the work equipment is not powered with extremely high compression motors which require the high-octane premium gasoline. Of course, in such a case the regular gasoline would not give satisfactory performance although the premium grade gasoline would be satisfactory on other work equipment having a lower octane requirement.

The small two-cycle gasoline engines should be fueled with a white, unleaded gasoline for best performance. Leaded gasoline seems to have a detrimental effect on this type of engine. Unleaded gasoline, while not generally available at service stations, can be procured from most oil companies.

The best guarantee that the user will obtain the correct gas is to patronize a reliable petroleum supplier. If there is any question as to the proper recommendation, the operator should ask for the services of a lubrication engineer for his recommendations.

"Regular" Is Usually Best Buy

By N. T. Brenner

Chief Fuels & Lubricants Engineer, Tractor Section, Gulf Oil Corporation, Pittsburgh, Pa.

Gasoline-powered railroad work equipment can be successfully operated, in most cases, on either regular or premium (high octane) gasoline. Regular gasoline (sometimes referred to as Motor gasoline or Housebrand gasoline) will provide the largest number of horsepower hours per dollar of fuel cost in equipment designed to utilize it. Most truck and industrial engines have been designed to operate satisfactorily on this fuel. High-compression engines, particularly those in passenger cars, and engines called upon to accelerate rapidly, will generally operate more satisfactorily on premium gasoline.

It should be clearly understood that premium gasoline does not deliver more power because of a high Btu. (energy) content, but because its higher octane value permits a higher engine compression

ratio to be used, or permits a greater spark advance in the same engine. This spark advance increases the power and economy. Consequently, if an engine which has been operated on regular gasoline is switched to a premium fuel, the engine should be "tuned up" to take full advantage of the increased octane number of this fuel. If this is not done, the higher cost of the premium gasoline cannot be justified.

It must be recognized that gasoline is a mixture of many hydrocarbons, some of which are relatively volatile to provide easy starting, while others are less volatile to provide the necessary power and economy. Therefore, a satisfactory gasoline for any industrial purpose must be a well-balanced fuel in order to provide easy starting, maximum power and economy in a single product. A satisfactory gasoline should have an octane number adequate for the purpose and should be low in gum and sulfur content and free of sediment. In order to avoid difficulties, it must be delivered in a clean condition, free of moisture, and must be kept in tanks or containers which will maintain it in this condition.

The average railroad requires that gasoline be delivered in relatively small quantities at a comparatively large number of delivery points so that it will be readily available at any point along the line. This means that the supply of gasoline must come from the storage tanks of suppliers located within reasonable trucking distances from the desired delivery points. It means, further, that this gasoline will be the brand regularly supplied to the trade and the railroad will not be able to secure special fuels designed around a particular specification at any reasonable price. Therefore, the best assurance that fuel of high quality will be received consistently is to purchase the brand of gasoline regularly distributed by a refiner of recognized reliability, the quality of whose products has been proven by public acceptance.

Using Metallic Floor Hardeners

To what extent can metallic floor hardeners be used with air-entrained concrete? Explain.

Not Recommended

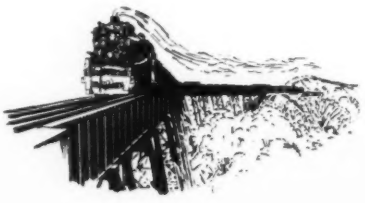
By W. P. Geiser
The Master Builders Company, Chicago

Generally speaking, we do not recommend the use of air-entrained concrete or air-entrained cement where a metallic floor surface is required. In situations where nothing but air-entrained cement is available the precautions outlined below will assist in getting a better floor surface. However, a heavy power float is almost "a must" for compacting the floor surface and working out air bubbles that form just below the surface.

Air-entrained concrete, whether produced through the use of interground air-entrained cement or by the addition of an air-entraining admixture, requires special control of the air content if it is to be used in finished floors.

Too high an air content in the concrete will frequently produce a very rubbery condition which is difficult to finish to a level, smooth surface. High air contents preclude necessary bleeding of sufficient magnitude to allow easy finishing. Unusually high amounts of air may separate from the mix and become entrapped in the form of bubbles below the surface being finished. These bubbles not only prevent troweling the floor to a level surface but also cause spots that are vulnerable to truck traffic and lead to early disintegration of the floor. High air contents, especially with foaming types of air-entraining agents, markedly reduce strength and make the floors less resistant to wear.

Regardless of whether a foaming type of air-entraining agent(interground or added at the mixer), or a cement-dispersing agent is used to produce air in the mix, it is necessary, for the best results, to limit the air content between 3 to 4 per cent. Use of an interground air-entraining cement for concrete floors is not recommended because it is difficult to control the air content to keep it below the allowable maximum of 4 percent.



After placing the concrete and screeding the floor to level, it should be allowed to remain "as is" until stiff enough to float—either by hand with wood floats or by mechanical floats. The floor surface should then receive no further working until all sheen has disappeared and stiffness has reached the point that a flat steel troweling can be made without bringing an appreciable amount of moisture to the surface. After the initial troweling the slab should be allowed to remain without further manipulation until ready for final troweling and then burnishing.

In applying metallic-aggregate dust coats to concrete slabs containing air-entraining agents, it is highly important to make certain that they are thoroughly incorporated into the surface of the slab. This is more difficult than with plain concrete mixes because of the lack of water gain on the surface of the slab. If thorough incorporation is not affected, scaling of the dust coat may result later on. Cement-sand dust coats occasionally needed on plain floors to facilitate finishing are not needed on air-entrained concrete which has been properly designed.

A metallic aggregate plus a cement-dispersing agent can be successfully incorporated into the surface of an air-entrained concrete slab if the above timing is followed and care is taken to make certain that it is thoroughly worked into the surface of the slab, and if the air content does not exceed the maximum limit given above. The use of normal non-air-entraining cement mixed with the metallic aggregate for the dust coat will greatly assist in incorporating it into the air-entrained concrete slab.

If cement dispersion is used in securing the air-entrainment and other desirable factors in the concrete slab, metallic aggregate with normal Portland cement may be used as the dust coat with concrete temperatures maintained above 50 deg. F. Below 50 deg. F., floor finishing presents many difficulties and requires special measures.

When dust coats of any nature are applied to air-entrained concrete slabs, the following precautions should be observed: (1) Reg-

ulate air content between 3 and 4 per cent; (2) screed and float or darby to level, then apply dust coat immediately but do not manipulate further until the concrete has stiffened somewhat; (3) float a second time and allow to remain until steel troweling doesn't bring excessive moisture to the surface; (4) flat trowel but do not overwork the surface; (5) final trowel and follow by burnishing.

Use with Ordinary Concrete

By L. H. CORNING
Manager, Structural & Railway Bureau, Portland Cement Association, Chicago

The recommended procedure for constructing heavy-duty concrete floors is to use a stiff concrete mix and finish it with a power float. When air-entrained concrete is used in such a mixture, practically no water bleeds to the surface. Under these conditions it is extremely difficult to incorporate any appreciable amount of dry materials into the surface and finish it properly. Thus a metallic hardener on air-entrained concrete is apt to scale or peel off.

If a wet mix is used with air-entrained concrete it is difficult to finish, whether or not a dry material is applied to the surface. This is so because the top surface tends to dry and stiffen while the concrete below the surface is still plastic. Because of these factors some manufacturers of metallic floor hardeners prefer that their product be used with non-air-entrained concrete.

Installation of Tie Pads

How and when should tie pads be installed? Out-of-face at the time rail is laid? On new ties as they are spotted in? Or under other conditions?

Apply When Rail is Laid

By A. E. BARDWELL
Western Division Manager, Fabreeka Products Company, Chicago

Specifically, the ideal time of installation is when rail is laid out of face, although pads may be placed when ties are spotted in.

It is important, however, that ties on which pads are to be installed have a smooth surface allowing even distribution of rail loads over the entire area of each pad. This means, of course, that only machine-adzed ties should be used in conjunction with pads. However, pads will compensate for any slight inequalities in the surface of ties.

By using smooth-surfaced ties, a self-sealing tie pad will provide a better bond between the pad and tie, thereby offering the maximum reduction of mechanical wear of ties, because, not only is plate cutting reduced, but also moisture and sand is excluded from getting in below the pad. It is this moisture and sand which penetrates and softens wood fibers, thereby increasing the tie plate cutting action.

Tie pads will show their economic value in such places as curves, bridge decks, switches, highway crossings, and station approaches where considerable braking of trains takes place.

On applications such as track scales, turntables, railroad crossings and high-speed turnouts, where severe impacts occur, the tie pad which is used for the reduction of mechanical wear of ties will not suffice. A material having a high damping value with the ability to snub out these impacts is necessary. Fabreeka pads have such characteristics. The placing of Fabreeka pads in these installations probably should be done at the time rehabilitation work is carried out. Again, we should bear in mind that, for maximum benefits, these pads should be placed on smooth-and-level bearing surfaces to insure even distribution of loads.

Install on Economic Basis

By H. S. ASHLEY
Assistant Engineer M. of W., Boston & Maine, Boston, Mass.

This question carries with it the assumption that tie pads should be used. Quite a few maintenance men will probably not fully agree with such a premise except as conditioned by certain reservations.

The use of tie pads is, like every other unit in the track structure, determined by an economic benefit. Initial cost plus the cost of installation represent an investment and it must first be determined that the investment will produce sufficient benefits to justify the expenditure. In evaluating the economic benefits of tie pads, we find, generally speaking, that: (1) To pay for themselves, they must add at least six years and preferably 10 years to the life of ties; (2) their use is not justified on light traffic lines; and (3) their installation should be made—(a) when new rail is laid on curves and on heavy grades or where sand is used freely; (b) when heavy tie renewals are made in resurfacing operations (spot installations are not recommended as uneven bearing may result); and (c) when bridge ties are renewed out-of-face on open-floor bridges.

In order that pads may better perform their intended function, it is believed necessary that they be thoroughly cemented to the ties, to exclude water and sand and assure that the wood fibers in the spike holes are kept dry and firm. This also prevents the movement or churning of the tie plate on the top of the tie. Such action, in the presence of water and sand, inevitably results in the penetration of the top surface of the tie by the plate when no tie pad is present to eliminate this churning effect and to absorb part of the impact. It is also essential that a careful adzing job be done before pads are installed so that an even bearing will be obtained and spongy wood removed.

The use of tie pads under insulated joints and on the shoulder ties adjoining them should result in a longer life for the insulation. Their installation under crossing frogs where impact is severe is also recommended.

Method Depends on Use

By JOHN A. CROWE
Manager, Tie Pad Division, Bird & Son, Inc., East Walpole, Mass.

The best time and method of installing tie pads depends on the type of application and the cost of ties or timber. On open-deck bridges there are four good procedures: (1) Install pads with new decks. This gives maximum extension to tie life and negligible installation cost. It is the most common present practice. (2) Install

with new rail on old decks whenever the under-plate wood can be adzed to a smooth surface on sound wood and if spike-hole wood is still adequate to keep spikes tight and to hold line. This method has the advantage of low installation cost and an earlier return on the investment. Almost full life extension can be realized if degradation of the under-plate wood is not too far advanced.

(3) Pull spikes to install pads immediately on decks having tie cost of $.50 per tie per year or more, especially if new rail is not due to be laid before serious under-plate damage is to be expected. With costs at this level, only two years of life extension are needed to pay for tie pads. An additional two years will more than pay for the installation. A four-year life extension will consequently more than pay for the installed cost of pads. A 10-year extension will yield a net return of $3 per tie.

(4) It is frequently practical to salvage old decks approaching the end of their life span by a deep mechanical adzing to a uniform depth and the installation of tie pads. For this purpose, it will pay to pull spikes and remove the rail immediately, if any appreciable life extension is likely. Under-plate and spike-hole wood can be expected to remain in status quo for 5 to 10 years or longer if degradation has not gone too far.

At turnouts and crossings the ideal time to install pads is either with new timbers or new frogs. The same reasoning used above will show that it is profitable to pull spikes to install pads in high gross-tonnage areas. There will be important savings from the maintenance on crossings and turnouts as well as from the life extension of timbers.

The savings from longer insulation life, less surfacing and longer tie life make it profitable to pull spikes and install pads at all insulated joints immediately. Savings are especially large where insulation life is less than two years and tamping is required once a year or oftener.

Tie pads can be economically installed at grade crossings with new rail or when the crossing is being renewed or surfaced. Savings result from longer tie life and less maintenance. Joints stay up to surface much longer and the rattling of rails and tie plates from highway traffic is eliminated for a long time.

It is usually economical to install pads on turntables, under circle rails and the ends of approach tracks. If the under-plate wood has deteriorated to a serious extent, the tie pads should be placed when new ties or timbers are installed. In open track, tie pads should be installed either out-of-face when the rail is relaid or they can be spotted in with new ties. In both cases the installation costs should not be over one or two cents per pad. Except on troublesome curves and in heavily-sanded areas, such as at station stops, water columns, and sharp grades, etc., savings from tie pads in open track are not enough to justify the cost of a special operation to install them. Out-of-face installations with new rail have the advantage of paying back quickly in the form of extremely low tie renewals for the first 10 years and reduced surfacing costs.

In low-tonnage track where a good return on an out-of-face tie pad investment may be questionable, it is practical to confine tie pads to the joint ties and to one to three ties on each side of the joint. Although experience is limited with this type of installation, it would clearly protect the fast-wearing joint ties and it would probably account for a major part of the savings that would result from a complete out-of-face installation.

All of these considerations are based on the use of tie pads of the type that form a genuine seal on the under-plate and spike-hole wood, capable of closing out sand, dust, air, and free surface water.

Predetermining Concrete Pile Lengths

What are the best methods of predetermining the required length of concrete piles so as to reduce or eliminate the need for cutoffs? Explain.

Several Methods Available

By A. B. WANG
Resident Engineer, Chicago, Indianapolis & Louisville, Lafayette, Ind.

When one thinks of concrete piling in relationship to railroad work, its use is for bents to replace wood-pile trestles, as approaches to large spans, and as spans over floodways or large bodies of water, particularly in southern territory. They have seen great use in highway bridges. They are also thought of where there is necessity for attaining great depths in difficult foundation conditions.

For large jobs, the cost and time necessary to get correct cutoff data is small as compared to the cost of the whole job. Tests need not be made at a very early date if piles are to be cast on the job or are carried in stock in storage yards. On small jobs where good pile-driving records have been kept on wood-trestle construction, such data will be of great help in determining the length of concrete piling without other tests. For new work simple auger drilling may give enough data where piles are not of great depth. The Gow system, whereby samples are taken out by a 2 in. tube, driven inside a 4-in. shell, gives ground conditions for every portion of drilling and bottled samples may be kept and tested. The number of blows necessary to drive a 4-in. casing is a good measure of resistance. These core-drilling outfits can readily be moved about by jeeps, carrying tripod, engine, hammer and casing. Core drilling can be done from boats or rafts if necessary. On large jobs a combination of core drilling at frequent intervals, say every other bent, and test piles at less frequent intervals should be used. The length of test piles are then based on this data.

On existing renewal jobs test piling can be driven from the old trestle by an on-rail pile driver. On new work a crawler crane with swinging leads can be used with piling set plumb in auger-bored holes. To furnish steam for the driver, a boiler can be set on skids and moved as needed. A double-acting, 3000-lb. hammer with a 12½-in. stroke is suitable for such driving. In all cases test piling can be set and driven in correct

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position so that it can be used in the final work with whatever cut-off or addition is necessary.

Test by Cores or Piles

By J. F. Lockwood
Supervisor Bridge Erection, Chesapeake & Ohio, Richmond, Va.

Where piles are to be driven to bedrock, the best method of determining the required length of concrete piles is to sink one or more test holes with a core drill. If the rock is known to be of fairly level formation, one test hole should be sufficient to determine the lengths of all piles. If the rock formation is sloping it may be necessary to have a test hole at each corner of a pile foundation and then the pile lengths can be determined by the difference in depth of test holes. If piles are to be driven in a single line as for bents, etc., one or two holes per bent will be sufficient for information.

If piles are driven where their bearing capacity depends on friction, the best method is to drive test piles. These test piles should be concrete or wood piles of approximately the same dimensions as the permanent piles.

Reclaiming Expendable Fuel-Oil Filters

Can expendable types of filter cartridges used at diesel fuel stations be reclaimed economically? If so, how? When? Explain.

Some Types Can't Be Cleaned

By J. A. Plummer
Manager, Micro-Klean Sales Division, The Curro Engineering Corporation, Meriden, Conn.

The answer to this question depends entirely upon the type of expendable filter cartridge used. Since we are, of course, most familar with our own equipment, we might discuss this question in relation to it first. Our Micro-Klean cartridge which we recommend for fuel service, is composed of a variety of fibers, felted and bonded in place by resinous impregnation. In this unit filtration takes place in depth with all contaminants or solids lodging throughout the fiber mass of the cartridge. It is next to impossible to dislodge such solids from this fiber mass after the cartridge becomes "loaded" to any degree at all. Hence, we do not recommend the cleaning of our filter elements. It has been tried with very poor results and, more often than not, the filter structure has been damaged in the process with subsequent loss of filtration efficiency.

We believe the same principle would hold true for any "depth"-type filter used for this service. This would include, for example, cotton-waste or other fiber-packed cartridges.

On the other hand, it would conceivably be possible to clean satisfactorily, any "surface" type filters that may be used in this service. We are thinking now of bags or certain types of paper units where the collection of solids or dirt is entirely on the surface. The particles could undoubtedly be washed or scrubbed off the surface or removed by back-washing. However, we do not manufacture equipment of this nature and we do not know the economics of the operation. We do know, however, that there is the possibility that repeated washing or cleaning will open up the filter structure so that subsequent filtration characteristics will grow increasingly inferior to those of the original clean element.

To speak quite frankly, the fuel user has a great deal more to gain economically by obtaining the most efficient type of filter cartridge in the first place rather than to try and make up for the inadequacies of inferior equipment by the rather doubtfull process of reclamation.

Economy Is Doubtful

By T. A. LaBrecque
Manager, Oil Purifier Division, The Hilliard Corporation, Elmira, N. Y.

There are two types of expendable cartridges in use. One consists of cotton waste or other similar material being compressed into filter cartridges. Although the cotton waste used in this type of cartridge could be reclaimed, I rather doubt if it would be practical because of the high cost. The other type consists of various forms of paper disks packed on center tubes.

Cartridges made up of paper disks cannot be reclaimed because they become sealed together when put into service, and if any attempt is made to remove them from the center tubes, they disintegrate.

When reclaiming cotton waste from fuel-oil filter cartridges, no doubt the same process could be used as is now being used for the reclamation of cotton waste used for journal-box lubrication.

The cotton waste used in cartridges for lubricating-oil filtration could be reclaimed by pressing the cotton waste for recovery of the oil contained therein, then washing the cotton waste in a solvent, perhaps with one or two rinses. This would require a considerable amount of solvent, but by the installation of solvent-recovery equipment, the losses could be reduced to a minimum. The oil could also be reclaimed through the conventional type of re-refiners being used extensively by the railroads.

What experience I have had in observing attempts to recover cotton waste used in both fuel and lubricating oil filter elements indicates to me that due to the high cost, this activity is impractical.

Some types Are Reclaimable

By F. L. Townsend
Wm. W. Nugent & Co., Inc., Chicago

Certain types of fuel-oil filter recharges may be reclaimed, others cannot. The type of recharges made of cotton waste can be reclaimed but recharges made of Fullers earth or cellulose paper cannot be reclaimed. We have a considerable number of fuel-oil filters which contain bag filtering elements. These bags are washed and reused many times.

Some railroads are now reclaiming the cotton-waste filter recharge and using the cotton waste for car-journal packing. For this to be done it is necessary that the recharge be made of long-strand cotton waste. Reclaiming cotton-waste recharges used for filtering fuel oil will not require as much cleaning of the waste as those used for filtering lubricating oils.

Because of the scarcity and high price of cotton waste at the present time, it may be economically sound for railway maintenance men to consider the reclamation of cotton-waste filter recharges.

THE MONTH'S NEWS

Railway Personnel

General

Ira W. Newman, division engineer on the Louisville & Nashville at Latonia, Ky., has been promoted to superintendent of the Cincinnati division.

M. I. Dunn, general superintendent of the Chicago division of the Chesapeake & Ohio, who has held various positions in the engineering department of that road, including that of division engineer at Huntington, W. Va., has been appointed assistant superintendent of freight transportation.

F. A. Hess, division engineer of the New York Central's terminal lines in the Chicago area, has been promoted to assistant to vice-president of the road's Lines West of Buffalo. Mr. Hess has spent his entire railroad career in

F. A. Hess

and around Chicago. He started to work as a junior engineer at the Union Stock Yards at Chicago on June 1, 1923, after graduation from the Armour Institute of Technology. In 1939 he was named assistant engineer in the vice-president's office. He became assistant to the general manager of the Indiana Harbor Belt and the Chicago River & Indiana on January 1, 1944, and division engineer on July 1 of that year.

Engineering

W. A. Schubert has been appointed division engineer of the River division of the St. Louis-San Francisco, with headquarters at Chaffee, Mo.

A. S. Barr, supervisor of track on the Maryland division of the Pennsylvania, at Wilmington, Del., has been promoted to assistant division engineer of the Northern division, at Erie, Pa., succeeding **Malcolm Young,** who has resigned.

F. G. Frederick, assistant division engineer of the New York Central's termin-

al lines in the Chicago area, with headquarters at Gibson, Ind., has been promoted to division engineer at that point, succeeding **F. A. Hess,** who has been advanced to assistant to vice-president,

F. G. Frederick

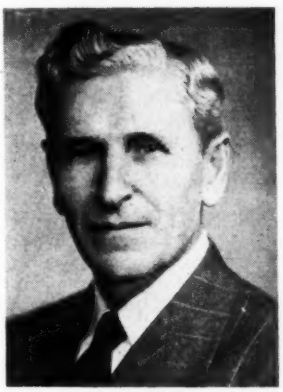
as reported elsewhere in these columns. Mr. Frederick is succeeded as assistant division engineer by **H. J. Van Dyke.**

A graduate of the Armour Institute of Technology, Mr. Frederick began his railroad career as an instrumentman in 1923. He was named assistant engineer on May 1, 1929, and assistant division engineer of the terminal lines on July 1, 1944.

Arthur C. Buck, assistant office engineer on the Atchison, Topeka & Santa Fe, at Los Angeles, Cal., has retired after 45 years of service.

M. C. Bitner, assistant to chief engineer of the Pennsylvania, has been appointed engineer maintenance of way, Western region, with headquarters as before at Chicago.

L. R. Jabinson, assistant division engineer of the Peoria & Eastern (operated by the New York Central), has been



L. R. Jabinson

promoted to division engineer, with headquarters at Indianapolis, Ind., succeeding **B. S. Dickerson,** who has retired after 39 years of service.

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Railway Personnel (Cont'd)

Mr. Jabinson, a graduate of the Cooper Union at New York, began his railroad career with the New York Central on January 21, 1919, as assistant engineer at Matoon, Ill. He served in that capacity there and at various other locations until February 1, 1943, when he became assistant division engineer of the Peoria & Eastern at Indianapolis.

Rush A. Kelso, assistant division engineer of the Atlanta division of the Southern, has been promoted to division engineer, with headquarters as before at Atlanta, Ga.

William J. Kernan, assistant district engineer on the Boston & Albany (New York Central affiliate), at Boston, Mass., has been promoted to division engineer of the Mohawk division of the N.Y.C., at Albany, N. Y., to succeed **A. R. Jones,** who has retired after 44 years of service. **E. M. Skelton,** supervisor of track of Subdivision 29, Eastern division of the N.Y.C., with headquarters at Brewster, N. Y., has been appointed assistant district engineer at Boston to replace Mr. Kernan.

W. E. Bailey, supervisor of track on Subdivision D of the Delaware & Hudson, at Oneonta, N. Y., has been promoted to engineer of track, with headquarters at Albany, N. Y., to succeed **J. C. Brennan,** who has been appointed division engineer of the Champlain division, at Plattsburg, N. Y. Mr. Brennan replaces **C. W. Reeve,** who has been transferred to the Susquehanna division, with headquarters at Oneonta, to succeed **R. S. Gutelius,** whose death was reported in the January issue.

Frederick H. Boulton, assistant division engineer, Evansville division, of the Louisville & Nashville, at Evansville, Ind., has been advanced to division engineer, Cincinnati division. He is succeeded by **Marow W. Cox,** assistant engineer water supply at Louisville, Ky., who is in turn succeeded by **John H. Upham,** assistant engineer, miscellaneous department, chief engineer's office. **Eugene R. Englert,** assistant engineer, Louisville division, at Louisville, has been appointed as Mr. Upham's successor. **Nicholas C. Kieffer,** draftsman in the chief engineer's office, succeeds Mr. Englert.

G. G. Amory, office engineer of the Chicago & Western Indiana and the Belt Railway of Chicago, has been promoted to engineer maintenance of way, with headquarters as before at the Dearborn station, Chicago, succeeding **V. V. Holmberg,** who, as announced elsewhere in these columns under Supply Trade News, has become associated with the Ellington Miller Company. Mr. Amory is succeeded by **D. E. Perrine.**

L. B. Elliot, assistant district engineer, Big Four district, of the New York Central System at Cincinnati, Ohio, has retired after 42 years of service. He is

succeeded by **A. A. Keever,** division engineer, Cleveland division, at Cleveland, Ohio, who has in turn been replaced by **L. W. Moss,** division engineer, Ohio Central division, at Columbus, Ohio. **K. E. Dunn,** assistant division engineer, Erie division, at Erie, Pa., becomes Mr. Moss' successor. Succeeding Mr. Dunn is **H. L. Riser,** assistant division engineer, Ohio Central division, at Columbus. **W. H. Goold,** supervisor of track at Detroit, Mich., replaces Mr. Riser.

Morton Friedman, valuation engineer of the New York Central, has been appointed chief valuation engineer, with headquarters as before at New York, succeeding **James H. Roach,** who has reached company retirement age, but who will continue for some months as consulting valuation engineer.

L. M. Poitevin, whose promotion to division engineer of the Laurentian division of the Canadian National, with headquarters at Quebec City, Que., was

L. M. Poitevin

announced in the December issue, was born at Riviere du Loup, Que., on August 9, 1918, and graduated from McGill university with the degree of Bachelor of Engineering in 1948. On discharge from the armed forces and prior to his return to college in 1944, he was employed as a draftsman in the department of research and development of the C.N.R. Upon graduation, he was transferred to the Cochrane division as instrumentman. Subsequently, Mr. Poitevin was appointed assistant engineer on the Laurentian division, and served in that capacity until his advancement to division engineer.

W. H. MacIlroy, whose promotion to division engineer of the Portage-Brandon division of the Canadian National, with headquarters at Winnipeg, Man., was noted in the January issue, was born in Vancouver, B. C., on December 16, 1910. He entered the service of the C.N.R. in May, 1927, as a machine operator at Vancouver. He later worked as a rodman at various points on the British Columbia district and in Alberta. In April, 1941, he was made instrumentman

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Railway Personnel (Cont'd)

on the Western region, and in November of the same year he was assigned to the Calgary division. In June, 1944, Mr. MacIlroy was appointed acting resident engineer, resident engineer the following year, and assistant engineer in February, 1947. He was transferred to the Smithers division as assistant division engineer in July, 1948, which position he held until his recent promotion.

Clarence C. Lathey, whose promotion to division engineer of the St. Lawrence, Adirondack and Ottawa division of the New York Central, with headquarters at Watertown, N. Y., was announced in the December issue, was born at Chicago on April 27, 1902, and was graduated in civil engineering from Queens University (Ontario) in 1925. He entered railway service with the N.Y.C. on July 13, 1925, as a chainman. Six months later he was promoted to rodman on the Adirondack division at Utica, N. Y., and in May, 1927, he was advanced to transitman at that point. From 1932 to 1935, Mr. Lathey held various jobs in the bridge and building department on the Mohawk division, and in November, 1935, he was appointed assistant foreman of the iron gang at Albany, N. Y. On June 15, 1936, he was appointed a draftsman in the office of the engineer maintenance of way at New York, and on November 1, 1937, he was appointed assistant supervisor of track at Fonda, N. Y. Mr. Lathey was made acting supervisor of track at Selkirk, N. Y., on December 1, 1940, and assistant engineer on the Electric division at New York on July 1, 1942. On June 21, 1943, he was promoted to assistant division engineer of the Electric division, and on May 1, 1944, he was appointed supervisor of track at Jersey Shore, Pa. He was again advanced to assistant division engineer of the Syracuse division, at Syracuse, N. Y., on January 1, 1946, and served in that capacity until his recent promotion.

William H. Hoar, who has been appointed engineer in charge of the construction of the Southern's new Ernest Norris yard and engine terminal facilities, with headquarters at Birmingham, Ala., as noted in the December issue, was born at Mills, Mass., on February 16, 1905. He entered the service of the Southern in June, 1939, as assistant engineer in the office of the chief engineer at Washington, D. C., and served in that capacity until May, 1943, when he was furloughed for military service. He returned to the road in January, 1946, as assistant engineer of bridges in the office of chief engineer maintenance of way, at Cincinnati, Ohio. In February, 1947, Mr. Hoar was appointed assistant division engineer at Birmingham, and, in 1949, was advanced to division engineer at Hattiesburg, Miss., retaining that position until his recent appointment.

Track

William T. Dunaway, supervisor of track on the Southern at Marion Junction, Ala., retired recently.

Nick Patti has been appointed supervisor of track of Subdivision 12 of the New York Central, with headquarters at Elkhart, Ind., succeeding **W. H. Hinderer**, who has been transferred.

Gerald P. Vicery, general foreman on the New York, Chicago & St. Louis, has been promoted to assistant roadmaster on the Fort Wayne division, with headquarters as before at Bellevue, Ohio.

Charles C. Morrow, section and extra gang foreman on the Cincinnati, New Orleans & Texas Pacific, a subsidiary of the Southern, has been promoted to assistant supervisor of track on the Southern at Dayton, Tenn.

L. J. McManus, extra gang foreman on the Bangor & Aroostook, has been promoted to roadmaster of District 1, with headquarters as before at Derby, Me., succeeding **H. H. Hodgman**, who has retired under the company's retirement plan, after 47 years of service.

E. C. Smith has been appointed roadmaster of the 81st track division of the St. Louis-San Francisco, with headquarters at Chaffee, Mo. **Kenneth E. Henderson** has been appointed acting roadmaster of the 82nd track division, with headquarters also at Chaffee.

D. A. Webster, assistant engineer on the Delaware & Hudson, at Albany, N. Y., has been promoted to supervisor of track on Subdivision J, with headquarters at Whitehall, N. Y., to succeed **B. W. Nyland**, who has been transferred to Subdivision H, with headquarters remaining at Whitehall. Mr. Nyland replaces **L. H. Rose**, who has been transferred to Subdivision D, at Oneonta, N. Y., to succeed **W. E. Bailey**, whose promotion to engineer of track is noted elsewhere in these columns.

F. A. Williams, assistant supervisor of track on Subdivision 12, Buffalo division, of the New York Central, at Batavia, N. Y., has been promoted to supervisor of track of Subdivision 29, Eastern division, with headquarters at Brewster, N. Y., to succeed **E. M. Skelton**, whose appointment as assistant district engineer of the Boston & Albany is noted elsewhere in these columns. **R. D. Bradley**, transitman in the engineering corps on the Mohawk division, at Albany, N. Y., has been advanced to assistant supervisor at Batavia to replace Mr. Williams.

Lee Dunn, section foreman on the Chicago, Rock Island & Pacific at Forest City, Ark., has been appointed acting roadmaster, with headquarters at Little Rock, Ark., succeeding **G. B. Winters**, who has been granted a leave of absence because of illness.

C. G. Greenwalt, assistant roadmaster on the Wisconsin division of the Chi-

(Continued on page 160)

Railway Personnel (Cont'd)

cago & North Western, has been promoted to roadmaster, with headquarters at Chadron, Neb., succeeding **P. J. Spellman,** who has been transferred to Madison, Wis. Mr. Spellman replaces **S. R. Nestingen,** who has resigned.

J. S. Fluke, junior engineer on the Philadelphia division of the Pennsylvania, has been promoted to assistant supervisor of track on the Columbus division, with headquarters at Columbus, Ohio, succeeding **J. E. Radcliff, Jr.,** who has been transferred to the Pittsburgh division. Mr. Radcliff replaces **J. H. Nolf, Jr.,** who has been promoted to supervisor of track on the Columbus division at Marion, Ind., succeeding **W. H. Lindsay,** who has been transferred to Northumberland, Pa. Mr. Lindsay replaces **D. A. Sutherland,** who has been transferred to the Ft. Wayne division, at Crestline, Ohio, to replace **E. Wollett, Jr.** Mr. Wollett has been transferred to the Maryland division, at Wilmington, Del., to replace **A. S. Barr,** whose promotion to assistant division engineer is announced elsewhere in these columns. **W. J. Yahn,** junior engineer on the Lake division, has been promoted to assistant supervisor of track on the New York division at Jamesburg, N. J., succeeding **C. N. Edwards,** who has been transferred.

David H. Yazell, whose promotion to supervisor of track on the Illinois Central, at Tutwiler, Miss., was announced in the December issue, is a native of Champaign, Ill., and was graduated from the University of Illinois in 1947, with a degree of Bachelor of Science in civil engineering. He entered railway service with the I. C. on October 1, 1947, as a junior engineering aide at Champaign, and on October 16, 1949, was promoted to assistant supervisor of track at Jackson, Miss., the position he held at the time of his promotion. Mr. Yazell served with the U. S. Marine Corps from 1943 to 1946.

Bridge and Building

Malcolm E. Condon, formerly track supervisor on the Erie at North Newark, N. J., has been appointed construction supervisor of the Eastern district, with headquarters at Jersey City, N. J., and **L. M. Swoap,** office engineer in the office of engineer maintenance of way, has been appointed construction supervisor of the Western district, with headquarters as before at Youngstown, Ohio.

I. K. Johnson has been appointed chief carpenter of the Coast division of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Tacoma, Wash., succeeding **Joe Maks,** who, at his own request, has been assigned to other duties. **W. E. McFadden** has been appointed assistant chief carpenter, succeeding **E. E. Thomas,** who has been assigned to other duties.

W. T. Towle has been appointed supervisor of bridges and buildings for the Wheeling & Lake Erie district of the New York, Chicago & St. Louis, with headquarters at Brewster, Ohio. He began work for the Nickel Plate in 1927 as a rodman. At the time of his promotion he was chief inspector of construction of the vertical lift bridge which is being built over the Cuyahoga river on the W. & L. E. district in Cleveland, Ohio.

Special

H. C. Greensides, principal assistant architect of the Canadian National, has been promoted to assistant chief architect, with headquarters as before at Montreal, Que.

Obituary

Thomas N. Stokes, retired supervisor of track on the Southern, died recently at Mobile, Ala.

William L. Kelly, track supervisor on the New York division of the Erie, with headquarters at Paterson, N. J., died recently at the age of 57.

For additional information, use postcard, pages 103-104

Association News

Metropolitan Maintenance of Way Club

The next meeting of the club will be held on February 20, in the Skyline Room of the Hotel Shelburne, Lexington avenue and Thirty-Seventh street, New York. The program will feature a non-technical talk by W. E. Gadd, manager of the Vapor-Drying Division, Taylor-Colquitt Company, Spartanburg, S. C., on the vapor-drying process and its various adaptations to railroad service. The program will be preceded by a dinner, beginning at 6:30 p.m.

American Railway Engineering Association

The plans for the annual convention, to be held March 13-15 at the Palmer House, Chicago, are nearing completion, and it is now possible to announce one

(Continued on page 162)

Meetings and Conventions

American Railway Bridge and Building Association—Elise LaChance, Secretary, 431 S. Dearborn Street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 13-15, 1951, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5

American Wood-Preservers' Association—Annual meeting, April 24-26, 1951, Stevens Hotel, Chicago. H. L. Dawson, Secretary-treasurer, 839 Seventeenth Street, N. W., Washington 6, D. C.

Bridge and Building Supply Men's Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—Next meeting February 26, 1951. E. C. Patterson, Secretary-treasurer Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

National Railway Appliance Association—Robert A. Carr, Secretary, 310 South Michigan avenue, Chicago 4; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association — Annual meeting September 25-27, 1951, Netherland Plaza Hotel, Cincinnati, Ohio. Roy M. Edmonds, Secretary-treasurer, 912 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago, 5.

Association News (Cont'd)

of the important features of the program—an address by John M. Budd, vice-president, operations, Great Northern, who will be the principal speaker at the luncheon on Wednesday.

Three committees have scheduled meetings for this month. They are the Committee on Wood Bridges and Trestles, February 9; the Committee on Maintenance of Way Work Equipment, February 5; and the Committee on Waterproofing, February 16. All these committees will meet at association headquarters, Chicago.

The February Bulletin (No. 493) will be mailed to members about the middle of the month. This bulletin will contain the reports of four committees, namely, Rail, Track, Roadway and Ballast, and Continuous Welded Rail.

Maintenance of Way Club of Chicago

With 197 members and guests in attendance the club met on January 22 to hear a talk by G. R. McSwain, special agent in charge of the Chicago office of the Federal Bureau of Investigation. Mr. McSwain's address was entitled "The F. B. I. at Work."

The next meeting of the club will be held on February 26 at the usual place—Eitel's restaurant in the Field Building at Chicago. The speaker at that meeting will be G. E. Gipe, division engineer, Pennsylvania, Fort Wayne, Ind., whose general subject will be "Maintenance Problems and How to Solve Them."

Supply Trade News

General

The **Black & Decker Manufacturing Co.**, Towson, Md., has announced the purchase of about 180 acres of land at Hampstead, Md., on which a branch plant for the manufacture of portable electric tools will be erected. It is expected that the construction work will get under way in April or May.

The **Air Reduction Sales Company**, New York, has announced the purchase of a site for the erection of another link in its chain of plants throughout the country for the manufacture of oxygen and nitrogen. The new plant and facilities, designed by Air Reduction and to be constructed by Koppers Company, Inc., will occupy a tract of land covering 23 acres in Butler, Pa. It is expected to be in operation in the latter part of 1951.

Personal

M. J. Donovan has been appointed assistant to the president of the **Franklin Railway Supply Company**.

The **Ralph W. Payne Company** has announced the appointment of **Charles L. Braunwarth** as sales representative, with headquarters at Washington, D. C.

James A. Higgs, resident manager of the **Massey Concrete Products Company**, has been elected vice-president, with headquarters as before at Atlanta, Ga.

The board of directors of the **Taylor-Colquitt Co.**, Spartanburg, S. C., has elected **W. Henry Caban** to the post of vice-president in charge of plant operations and engineering.

Walter A. McLean has been appointed manager of erection of the **Industrial Brownhoist Corporation**, Bay City, Mich. Mr. McLean, who had been serving in a sales and service capacity with the Philadelphia (Pa.) office, replaces the late **John J. Schreck**.

Koppers Company, Inc., has announced the appointment of **Jesse P. Hesley** as acting superintendent of its Bradford (Pa.) treating plant, succeeding **R. P. Williams**, who has been promoted to a more responsible position at Koppers' Newport (Del.) installation.

The promotion of **Frank J. Benko**, **John M. Benko** and **Fred T. Grant** from

the service department to field sales-service representatives of the **Power Ballaster Products Division** of the **Pullman-Standard Car Manufacturing Company**, Chicago, has been announced by John A. Curtis, manager of the division.

L. W. Jander, whose appointment as sales manager of the industrial division of **Henry Disston & Sons, Inc.,** was reported in the January issue, has served with the Disston organization for 16 years. His work has been concentrated

L. W. Jander

exclusively on industrial sales and distribution problems, sales promotion work and specialized sales activities. Since 1947 he has been in charge of Disston's Eastern sales division operations, and for six years before then he was Eastern and Southern sales representative.

V. V. Holmberg, engineer maintenance of way of the Chicago & Western Indiana and the Belt Railway of Chicago, has joined the **Ellington Miller Company,** Chicago, a contracting firm.

W. E. Miles, manager of the Industrial division of the **Oliver Corporation,** Cleveland, Ohio, has been elected vice-president in charge of crawler-tractor and industrial sales for the company.

Clarence B. Flint, vice president and a director of the **National Aluminate Corporation,** with headquarters at Indianapolis, Ind., has retired from full-time service. He will remain semi-active, however, and will serve the railroad department of the company in a consulting capacity. Succeeding Mr. Flint is **J. L. Gibboney,** assistant vice-president at Chicago.

By action of the board of directors of the **Maintenance Equipment Company,** Chicago, following the retirement on January 1 of **Thomas E. Rodman** as president, **Max K. Ruppert,** who has directed the executive policies of the company for the past several years, was elected president. **Emmons Overmier,** vice-president in charge of engineering, was elected executive vice-president, and **Peter J. Wolf** was reelected secretary and treasurer. Mr. Wolf was also vest-

(Continued on page 164)

Max K. Ruppert

Emmons Overmier

Peter J. Wolf

Thomas E. Rodman

ed with the title and duties of sales manager and will have charge of the sales and service of the products manufactured by the company.

Mr. Ruppert, a native of Grand Rapids, Mich., was graduated from the New Mexico Military Institute, after which he served one year there as instructor. He then went with the Chicago, Rock Island & Pacific as a chainman, later serving as rodman, ballast inspector and rail inspector. In June, 1922, Mr. Ruppert became associated with the P.&M. Company and was advanced to assistant general sales manager in 1926, assistant eastern manager in 1928, vice-president in 1931, and president in 1943. He now holds the latter post as well as that of president of the Maintenance Equipment Company.

Mr. Overmier was graduated in mechanical engineering from the University of Illinois in 1913, after which he completed a year of post-graduate work there. He began his business career with the Packard Motor Car Company and later served with the Standard Oil Company of Indiana. He became associated with the Maintenance Equipment Company in 1921.

Mr. Wolf was born at Amsterdam, Holland, and came to this country in 1927. He obtained his basic education at Oak Park, Ill., and later attended North Western university. He began his business career with the Western Electric Company, serving in the engineering department. Prior to joining the Maintenance Equipment Company in 1940, Mr. Wolf was engaged in general sales work. He was elected secretary and treasurer of the company in 1948.

Mr. Rodman, a native of Philadelphia, Pa., was graduated from the University of Pennsylvania in 1906. Prior to joining the Maintenance Equipment Company in 1928, he served successively as assistant to vice-president, Atlantic Refining Company; chief engineer and assistant general manager, Trinidad Lake Asphalt Company; partner, A. R. Brunker & Co.; vice-president, Atlantic Steel Castings; manager of sales, Eastern Steel Castings Company; and assistant to vice-president, Bradford Corporation.

Tom Shea, district representative in the 13 Northeastern states and Eastern Canada of the **Athey Products Corporation,** Chicago, has been promoted to general sales manager. **A. T. Marchuk,** assistant domestic sales manager has been promoted to domestic sales manager.

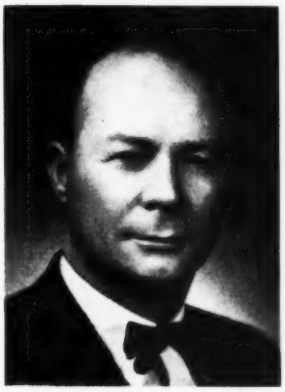
Mr. Shea, after completing his education at the Harvard Business School in 1935, became associated with the

Tom Shea

Harnischfeger Corporation, Milwaukee, Wis. After the war he was made district manager at New York for the Le-Roi Company, and in 1948 became general sales manager at Milwaukee.

Mr. Marchuk joined the Athey organization in 1936 after completing his education at Northwestern University. Prior to his recent promotion he had served as traffic manager, supervisor of the order department, production manager and assistant domestic sales manager.

D. B. Bishop, whose appointment as manager of the Pittsburgh (Pa.) office of the **Dearborn Chemical Company** was announced in the January issue, has been



D. B. Bishop

a sales representative for Dearborn in the Pittsburgh area since 1937. Before then he was a sales engineer for the Electrical Welding Division of the Fort Pitt Bridge Works. Mr. Bishop is a graduate civil engineer, having attended the Tri-State College in Indiana, the University of Pittsburgh, and the Carnegie Institute of Technology.

Robert T. Haslam has been elected to the board of directors of the **Worthington Pump & Machinery Corp.,** Harrison, N. J.

The creation of an additional sales division, to be known as the Plains division, has been announced by the **Caterpillar Tractor Company,** Peoria, Ill. To staff the new organization, the following promotions have been made: **Kenneth F. Ames,** head of sales training, becomes sales manager, Plains division; and **Lee Morgan,** district representative in New York state, and **Gordon Fowler,** Eastern sales division assistant, become assistant sales managers.

The appointment of **E. Preston Calvert** as director of public relations for the **Pullman-Standard Car Manufacturing Company, Chicago,** has been announced by Charles W. Bryan, Jr., president. At the same time, **Hugh W. Foster** was appointed advertising manager, and **Paul Ackerman,** editor of employee publications.

The **Duff-Norton Manufacturing Company,** Pittsburgh, Pa., has announced the appointment of **T. W. Kruger** as assist-

Supply Trade News (Cont'd)

ant general sales manager. Mr. Kruger joined Duff-Norton in 1947 as advertising and sales promotion manager. In his new post he will continue to direct advertising and sales promotion activities.

The **Cullen-Friestedt Company** has announced the appointment of **H. M. McFarlane** as sales manager, with headquarters at Chicago. Mr. McFarlane has been associated with the railway equipment and supply industry for many years, and is now president of the National Railway Appliances Association.

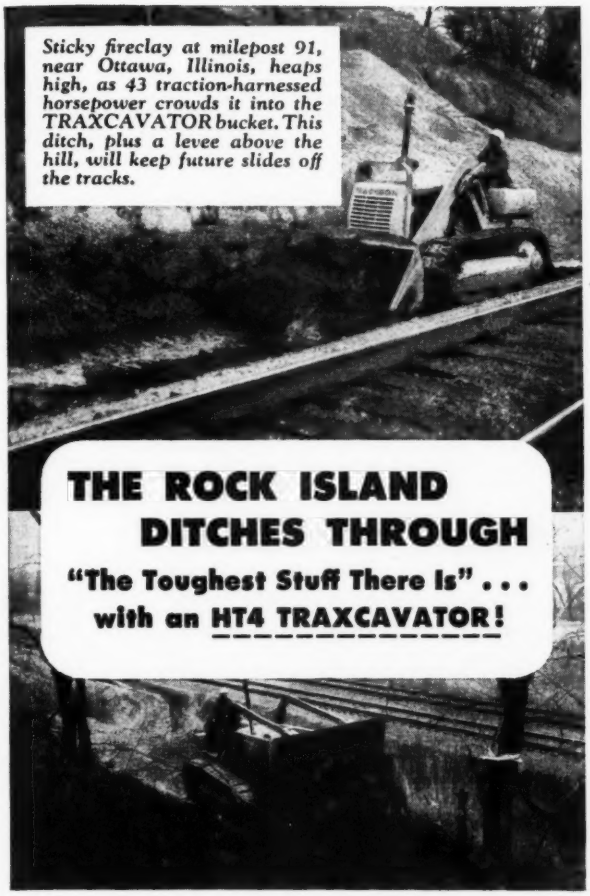
H. M. McFarlane

Joseph V. Condon

Joseph V. Condon, whose promotion to assistant to vice-president of the **Canadian Railroad Service Company, Ltd.,** a unit of the **Union Carbide & Carbon Corp.,** was announced in the January issue, began his railroad experience with the Canadian National in 1928. He joined Canadian Railroad Service in 1941, and was supervisor of maintenance of way at the time of his promotion.

Obituary

G. J. Slibeck, engineer of railroad sales for the Pettibone Mulliken Corporation, Chicago, died on January 9.



Sticky fireclay at milepost 91, near Ottawa, Illinois, heaps high, as 43 traction-harnessed horsepower crowds it into the TRAXCAVATOR bucket. This ditch, plus a levee above the hill, will keep future slides off the tracks.

THE ROCK ISLAND DITCHES THROUGH

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Hauling 200 feet up a 10% slope, the HT4-D4 team casts waste material into a hillside gully. Positive dumping action gets rid of ALL the sticky material.

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Stopping slides in their tracks is only one of the many jobs the Rock Island assigns to versatile TRAXCAVATORS. The low-cost, one-man work-crew gets work done faster and done right.

Streamline your off-track operations with any of the five TRAXCAVATOR models (bucket capacities from 1/2 to 4 cubic yards). Write TRACKSON COMPANY, Dept. RE-21, Milwaukee 1, Wisconsin.

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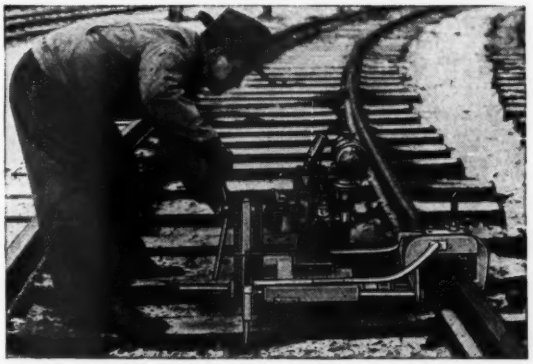
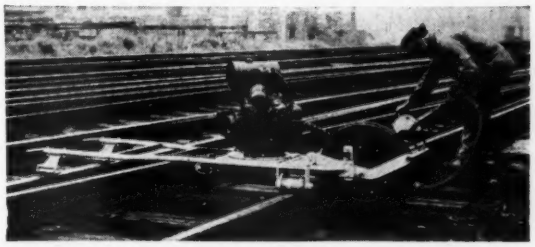
Two popular RTW maintenance machines are shown below—others available also give you labor-saving advantages at substantial savings.



RTW'S MODEL P-43 POWER TRACK DRILL gives you 60-second drilling . . . quick, accurate drill-leveling . . . easy-acting, easily-controlled screw feed . . . easy-handling (aluminum castings keep weight down to 125-lbs.) . . . quick on/and/off-rail action . . . chuck jaws that take beaded bits up to 1½" and automatically stay open when chuck is loosened.



RTW'S MODEL P-44 PORTABLE FLEXIBLE SHAFT GRINDER is designed to give you added savings in labor and costs when you lay new track or repair old.

Grinder's 360° swivel engine mount prevents short bends and kinking of flexible shaft . . . clutch assembly in the engine protects shaft from overload . . . three position wheel clears switches and crossovers easily . . . light and compact, it gets on and off the track fast . . . quickly adaptable for auxiliary equipment: Straight Wheel Hand Piece, Angle Hand Piece for Cup Wheel, Cross Grinder Guide and Track Drill.

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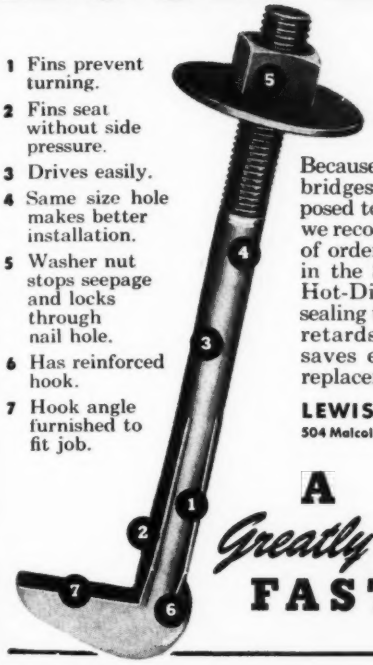

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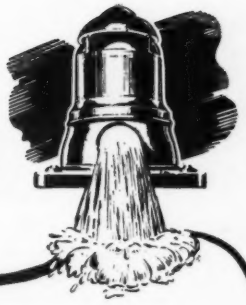

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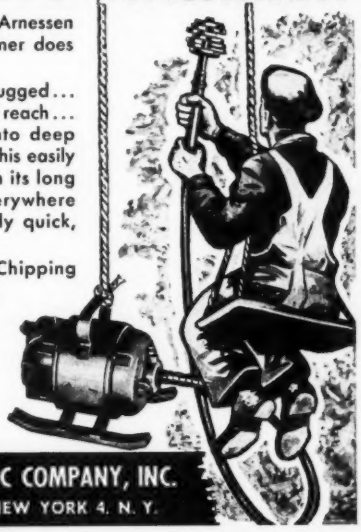

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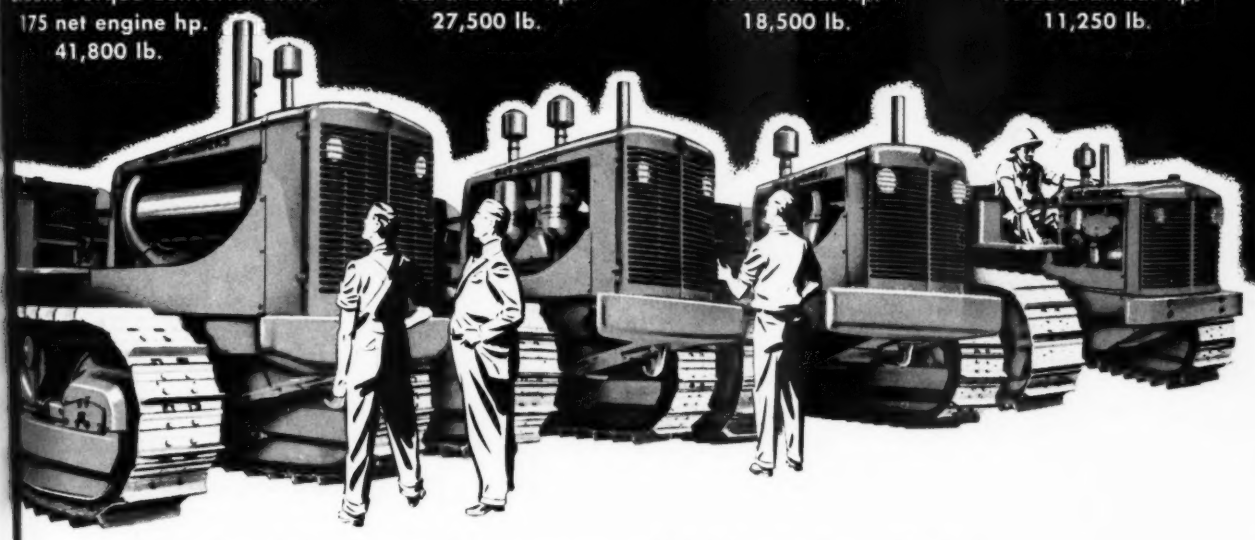

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